

# THE SIGHT-SAVING REVIEW

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# 50TH ANNIVERSARY CONFERENCE

Philadelphia—March 12-14, 1958

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Review of a half-century of progress in blindness prevention and a resolute look at the problems ahead characterize the National Society's 1958 meeting.

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**I**N June 1908 Louisa Lee Schuyler, brilliant leader and organizer of early social welfare movements, formed the New York State Committee for the Prevention of Blindness. She had been appalled by some of the facts revealed in a report made earlier to the Legislature by Dr. F. Park Lewis of Buffalo, president of a commission to investigate the condition of the blind in the state. This report of 585 pages included a section of 20 pages on the incidental topic of prevention of blindness. It began: "In the study of blindness throughout the State of New York, as elsewhere, the members of your commission have been profoundly impressed with the fact which has constantly forced itself on their attention, that a large part of it was unnecessary and preventable. . . ."

Particularly distressing to Miss Schuyler was Dr. Lewis's statement that thousands of sightless children would never have been so if a simple precaution had been taken at the time of their birth.

Among others active in the work of this first state committee were Dr. Lucien Howe, Dr. J. Clifton Edgar, Helen Keller, Edith and Winifred Holt and John M. Glenn. With an appropriation of \$5,000 from the Russell Sage Foundation they set to work, and thus began the first coordinated

effort for blindness prevention in the United States. Although the scope of the committee's activities was limited to New York State the task they faced was enormous. The causes of most blinding eye diseases were unknown; legislation requiring proper supervision and higher standards among midwives, who then attended 42 per cent of births in Greater New York, was inadequate, and accounted for much unnecessary infant blindness; the public knew little about eye care and protection.

A decisive attack on ophthalmia neonatorum, the disease which causes blindness at birth, was the committee's first project. Its prevention program gradually broadened, the state committee became a national committee in 1915; and finally on January 1, 1928 this became the National Society for the Prevention of Blindness.

## Review of Fifty Years

The record of success in the battle against blindness during the past half-century was reviewed by Mason H. Bigelow, president of the National Society, in his welcoming address to the delegates at the 50th Anniversary Conference held at the Bellevue-Stratford in Philadelphia, March 12-14. Such sight-destroying diseases as ophthalmia neonatorum, trachoma

and retrolental fibroplasia—each a major scourge at one time—have yielded to the pressures applied in research, education and preventive service. Loss of sight due to infectious diseases has been cut in half; eye injuries reduced by 75 per cent.

There are many to whom credit should go for these advances, Mr. Bigelow said, many whose names belong in any complete account of accomplishments marking the last 50 years as the most productive ever known in the campaign to preserve the precious element of human sight. The National Society has worked aggressively through direct action where advisable. It has also served as a catalyst, bringing groups together for organized joint and cumulative effort, and exchange of ideas. The annual conferences have included physicians, public health authorities, nurses, educators, social workers and industrial safety experts.

#### **Society's Membership**

Today the National Society has nearly 50,000 members and donors, Mr. Bigelow reported. State and local affiliates are active in 31 states and Puerto Rico. Special project committees advise in relation to research; education of partially seeing children; vision screening; glaucoma study and case-finding; and industrial problems.

"The future will produce an even greater need for growth and expansion of efforts to save sight," said Mr. Bigelow, "and the Society will be called upon for leadership. We are ready to continue the fight with the same spirit that inspired that small, dedicated group 50 years ago."

Much of the success of the 1958 meeting was due to the efficient plan-

ning and generous hospitality of Robert F. Irwin, Jr., prominent Philadelphia attorney and National Society board member. Mr. Irwin is a board member of the Pennsylvania Working Home for the Blind, affiliate of the National Society, and has rendered outstanding service in the cause of blindness prevention over a long period of years. He worked closely with Dr. Franklin M. Foote, the National Society's executive director, and with Mrs. Virginia Smith Boyce, assistant director, in setting up the conference program.

"The Volunteer in Prevention of Blindness" was the subject of the first session on Wednesday morning, March 12. Dr. Ira V. Hiscock, chairman of the department of public health, Yale University School of Medicine, presided. The Louisville program of preschool vision screening by Delta Gamma volunteers was described by Dr. Charles T. Moran, whose paper appears in this issue. Other speakers were Mrs. Carl J. Rudolph, NSPB Indiana Chapter; Mrs. Marvis Quam, secretary, Colorado Chapter; and Dr. Leon Kaplan, chairman, Professional Advisory Committee, Bridgeport, Connecticut, all of whom reported on varied activities carried on successfully by volunteer groups.

#### **Eyes in Industry**

At the industrial session Wednesday afternoon James E. O'Neil, NSPB director of industrial service, presided. Dr. Ralph C. Lanciano, ophthalmologist, and William E. Brunton, vocational director, dealt with the eye program in the Philadelphia Trade Schools. Interest in initiating such a project was sparked by Mr. Irwin, who discussed it in 1956 with Dr.

Allen H. Wetter, superintendent of schools. Dr. Wetter immediately went into action and arranged a conference of school officials. Mr. O'Neil was invited to participate. Consideration was given to a 100 per cent mandatory eye protection program for students in all school shops and chemistry laboratories. As a first step it was agreed that starting February 1, 1957, the Philadelphia school district would supply protective eyewear for all boys enrolled in the machine shops of the three vocational schools. Each student is required to deposit a dollar when his safety glasses are issued; this to be returned upon his graduation from school. A boy who is unable to make the deposit receives glasses anyway.

Mr. Brunton reported that practically every boy who has graduated from the machine shop course has asked if he may keep his safety glasses for use when he enters industry.

Providing eye protection for students presents some special problems, Mr. Brunton pointed out. "We have a large number enrolled in September and February," he said. "We have not yet solved the problem as to how these pupils can be measured and supplied with glasses the first day they are admitted to classes; there may be a lag . . . from the time the pupil is measured until the purchasing department obtains the glasses. We are devising a way of stocking various sizes, in order to correct this situation."

In the near future the program will be expanded to include students in wood, auto body and fender shops, foundry practice and industrial chemistry. Eventually all enrolled in senior high school shops as well as vocational-technical schools will be included. This



Mayor Richardson Dilworth of Philadelphia, left, chats with NSPB President Mason H. Bigelow, at the 50th Anniversary Conference luncheon held at the Bellevue-Stratford on March 14.

will be a complicated task since in a single week as many as 300 different boys may be assigned to a single school shop; and one pupil may work in five or six different shops during his three-year school course. However, Philadelphia school administrators are determined to find practical ways and means of making the eye program one hundred per cent successful.

At this industrial session papers of particular interest were presented by Louise Candland, R. N., occupational health nursing consultant, Employers Mutuals of Wausau, New York Branch; Lowell F. Johnson, director of industrial relations, American Home Products Corporation, New York; and Robert W. Verhaaren, safety supervisor, Ford Instrument Company, Division of Sperry Rand Corporation, Long Island City. All these and many other conference discussions will be reported later in the *Review*.

#### Teaching the Partially Seeing

Another Wednesday afternoon session was devoted to "Teaching Par-



tially Seeing Children at Various Grade Levels." Charles C. Wilson, M.D., professor of education and public health, Yale University School of Medicine, New Haven, Conn., presided. A digest of Mrs. Helen Auerbach's discussion on arithmetic appears in this issue. Mrs. Wilma Schneider Viseur of Decatur, Illinois, dealt with "Educational Enrichment Through Auditory Aids"; and Miss Rose Petrino of Trenton, N. J., with "Methods of Teaching Reading."

### Cooperation in Eye Care

A unique panel presentation on the value of professional cooperation in eye patient care was the feature of the morning session on the second conference day. Mrs. Marcella C. Goldberg, director, welfare services, Pittsburgh Branch, Pennsylvania Association for the Blind, served as moderator, and the discussants were: Jay G. Linn, Jr., M.D., assistant professor of ophthalmology, University of Pittsburgh School of Medicine; Mrs. Cecilia Francis, prevention of blindness worker, Pittsburgh Branch, Pennsylvania Association for the Blind; Mary Mally, chief psychiatric social worker, Staunton Clinic, Department of Psychiatry, University of Pittsburgh School of Medicine; and Mildred Czar, instructor in surgical nursing, University of Pittsburgh School of Nursing.

This proved to be a most stimulating and informative report on a specific glaucoma case, showing the interlocking of various services over a considerable period of time.

### Scientific Advances

Reports of progress in eye research and the treatment of blinding diseases

were heard by a large audience at the Thursday afternoon session at which Dr. Francis Heed Adler, head of the department of ophthalmology, University of Pennsylvania Medical School, presided. The papers of Dr. I. S. Tassman and Dr. Bernard C. Gettes appear in this issue. Other speakers were Dr. A. E. Maumenee, ophthalmologist-in-chief, Wilmer Eye Institute, on "Medical Management of Primary Glaucoma"; Dr. Wilfred E. Fry, professor of ophthalmology, Graduate School of Medicine, University of Pennsylvania, on "Surgical Management of Primary Glaucoma"; and Dr. Edmund B. Spaeth, emeritus professor of ophthalmology, Graduate School of Medicine, University of Pennsylvania, on "Congenital Cataracts."

The Friday morning session was characterized by a lively, spontaneous



Robert F. Irwin, Jr., left, leading Philadelphia citizen and NSPB board member, presents Wise Owl Club charter to William E. Brunton, vocational director of Philadelphia's public schools, which have recently inaugurated an eye program. The club is sponsored by NSPB in the interest of eye safety in industry and in shop training. Its members have saved their eyes from accidental injury by wearing proper protection.

## TELEGRAM READ DURING THE CONFERENCE

MASON H. BIGELOW, PRESIDENT  
NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS  
ANNUAL CONFERENCE, BELLEVUE-STRATFORD HOTEL, PHILADELPHIA

I AM HAPPY TO OFFER CONGRATULATIONS TO THE NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS NOW IN ITS FIFTIETH YEAR OF SERVICE IN ITS FIELD. RESEARCH ON DISEASES OF THE EYE AND DEVELOPMENT OF NEW PREVENTIVE MEASURES FOR COMBATting IMPAIRMENT AND LOSS OF VISION IS A MOST NECESSARY AND PRAISEWORTHY UNDERTAKING WHICH BENEFITS IN SOME WAY ALMOST EVERY ONE OF US. RESULTS OF YOUR 1958 CONFERENCE IN PHILADELPHIA WILL UNDOUBTEDLY SERVE AS A FURTHER STIMULUS TO THOSE WHOSE EFFORT AND SKILL COMBINE TOWARD ELIMINATING THE DESTRUCTIVE FORCES WHICH EACH YEAR TAKE SUCH A HIGH TOLL OF HUMAN SIGHT. THE OCCASION SHOULD ALSO BRING TO CLOSER PUBLIC ATTENTION THE HEARTENING POSSIBILITIES FOR BLINDNESS PREVENTION CONSTANTLY STRESSED BY THE NATIONAL SOCIETY THROUGH THE MANY SERVICES OF ITS NATIONWIDE EDUCATION PROGRAM

GEORGE M. LEADER  
GOVERNOR OF PENNSYLVANIA

discussion of "Public Relations for Local Prevention of Blindness Work." The delegates had the unusual opportunity of consulting an outstanding panel of experts in this field: James L. MacWithey, vice president, Bristol-Myers Company, *chairman*; Irving I. Rimer, executive director, National Publicity Council for Health & Welfare Services, New York; George B. Schless, Schless & Company, New York; Victor Weingarten, Victor Weingarten Public Relations, New York; Pierre C. Fraley, science and medical writer, Philadelphia *Evening Bulletin*; and Mrs. Jane Davis Ellen, executive secretary, Maryland Society for the Prevention of Blindness, Baltimore.

This session was one of the conference highlights, indicating the keen

interest of the delegates in public relations techniques and tools of communication.

### Friday Luncheon

The conference came to a close in an atmosphere of good fellowship and accomplishment at a luncheon on Friday at which Mr. Irwin presided. Mayor Richardson Dilworth expressed his pleasure over the fact that Philadelphia had been chosen for the conference, particularly in view of the extensive prevention of blindness work that has long been carried on in the city and throughout the State of Pennsylvania.

"Some Observations on Saving Sight" were made by Norman V. Lourie, deputy secretary for social welfare, Pennsylvania Department of

Welfare, Harrisburg, the principal speaker on this occasion. Mr. Lourie emphasized the great need in this country for an organized and consistent program of general medical care, including special eye care, for those of low income status. He said that the ultimate savings to the community at large resulting from preventive care, early diagnosis, prompt treatment and effective rehabilitation should be far in excess of the cost, to say nothing of the saving in human suffering and economic loss to the individual who is visually handicapped. For the immediate future, Mr. Lourie said, one of our best preventive devices is mass screening. The estimated high incidence of undetected glaucoma among adults, and the large number of school-age children requiring eye care indicate types of problems calling for broad-based, mass techniques.

A delightful program of instrumental music was given during the luncheon by four students from the Overbrook School for the Blind. Philip Tyrell directed; the other members of the ensemble were Robert Enck, Timothy Finan and Martin Nelson.

Later Friday afternoon the members of the conference were given an opportunity to visit Wills Eye Hospital.

A variety of exhibits were on view during the meeting, featuring orthoptic techniques, vision screening devices, optical equipment, publications, and the services of prevention of blindness agencies.

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1959 NSPB CONFERENCE  
February 25-27  
Hotel Statler, New York City

## HEALTH SPENDING RISES

During the last 15 years private gifts for health purposes have increased more than tenfold, according to estimates of the U. S. Department of Health, Education, and Welfare. A larger proportion of the philanthropic dollar is now going to health programs. The \$71 million contributed in 1940 was 6 per cent of all philanthropic giving, while the \$775 million contributed in 1955 was 13 per cent.

The gifts were made for church and secular health services and care, for hospital construction, and for a category which includes research, laboratory, and health information services. In 1955 gifts for this last category were \$230 million, double that contributed a decade before. National health agencies are tending to increase their expenditure for research, which in 1955 amounted to more than \$20 million, a third more than in 1954.

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## THE EYE GODDESS

A network of fertility cults centering on the human eye once spread over a great part of the ancient world, according to the British archaeologist Dr. O.G.S. Crawford. In his book, *The Eye Goddess*, reviewed in *The Optician* (London), he describes the migration of the eye symbol among agricultural peoples who worshiped a mother-goddess. Ishtar, the mother-goddess of Sumeria, was the greatest figure. In the Eye Temple dating back to about 3,000 B.C., were found hundreds of figurines with multiple eyes.

The solar deities Ra and Horus of ancient Egypt were associated with the eye symbol. Crawford traces the spread of the cult through western Europe and parts of Africa, as revealed by tomb-carvings, pottery, and paintings. He finds survivals of the ancient religion in eye-charms, folk dramas and odd beliefs from southwest England to Syria.

## Ira V. Hiscock Named NSPB President

**I**RA V. HISCOCK, Sc.D., professor and chairman of the Yale University department of public health, was elected president of the National Society for the Prevention of Blindness at a meeting of its board of directors in New York on May 22.

Dr. Hiscock, who is also chairman of the Yale University Board of Health for student health affairs, succeeds Mason H. Bigelow, who has been elected to the newly created office of chairman of the board. Mr. Bigelow is senior partner in the New York law firm of Gould and Wilkie and has been president of the National Society since 1940.

Dr. Hiscock was born in Farmington, Maine. He received the degrees of B.A. and M.A. from Wesleyan University, and the M.P.H. from Yale. He received an honorary Sc.D. from Wesleyan in 1931.

Prior to becoming a member of the Yale faculty in 1921, Dr. Hiscock was in public health work in Connecticut and South Carolina. He is well known for the many public health surveys that he has made of cities and states in various parts of the country. Since 1928 he has been a member of the Board of Health of New Haven, and since 1951 of the Connecticut State Public Health Council.

Dr. Hiscock is the author of: *Community Health Organization*, published by the Commonwealth Fund; *District Health Administration*, published by the Milbank Fund; and *Ways to Community Health Education* (jointly with Mary Connolly, Marjorie Delavan, Raymond Patterson and William Warthen), Commonwealth Fund.



**IRA V. HISCOCK, Sc.D.**

Professor and Chairman  
Department of Public Health  
Yale University

Dr. Hiscock served as a first lieutenant in the United States Army in the Surgeon's Office of the 30th Division of the Army Expeditionary Force in World War I; and as chief of the public health section of the Civil Affairs Division of the War Department in World War II with the rank of colonel.

He was president of the National Health Council from 1938 to 1940; president of the Connecticut Society for Mental Hygiene 1939 to 1941; president of the Connecticut Tuberculosis Association 1940 to 1942; president of the American Association of Schools of Public Health in 1954; president of the American Public Health Association 1955 to 1956. He was elected to the board of the National Society for the Prevention of Blindness in 1938, to the executive

committee in 1941, and served as a vice-president 1950 to 1953.

In accepting the office of president Dr. Hiscock said: "The opportunity to devote myself in this way to the work of blindness prevention could not be more humbly received. I ask the continued support not only of ophthalmologists but of all who are concerned with the unnecessary loss of sight. I am aware of the scope of the problem and convinced that we must continue to attack it vigorously. I look forward to the privilege of this association as well as its responsibilities."

Mr. Bigelow told board members he was encouraged by progress made in recent years to reduce loss of sight from many causes. "However," he added, "we must expand our efforts—particularly in research into the still unknown factors which lead to much of today's blindness from glaucoma, cataract and other tragic eye diseases."

Joseph E. Nichols of Richmond, Virginia, director of safety for Reynolds Metals Company, was elected a vice-president of the Society. He has been a director since 1953.

Enos W. Curtin, New York investment banker and president of the Ophthalmological Foundation, was elected a member of the Society's executive committee. He has been a director since 1957.

In line with the need for expansion of the Society's program, as emphasized by Mr. Bigelow and Dr. Hiscock, the appointment of a new worker to the field staff was approved. Miss Carolyn Hays of South Bend, Indiana, a graduate of Illinois State Normal University, will have the responsibility of developing better vision screening and other case-finding projects in various

states. Miss Hays has been a teacher of partially seeing children in the public schools of South Bend and has worked as a volunteer in various activities of the NSPB Indiana Chapter.

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### **JANSEN NOYES, JR. HEADS AMERICAN FOUNDATION**

Jansen Noyes, Jr. has been elected president of the American Foundation for the Blind. He succeeds William Ziegler, Jr., who was president from 1946 until his death on March 3.

Mr. Noyes, of the investment firm of Hemphill, Noyes and Company, has been a member of the board of the National Society for the Prevention of Blindness since 1953, and served as a vice-president for 1957-1958. He is also a member of the Society's executive committee.

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### **Appointments to National Institute Advisory Council**

Announcement was recently made of appointments to the councils that advise the various National Institutes of Health on awarding of grants to individuals and institutions outside the Federal government. Appointed to the advisory council of the Institute of Neurological Diseases and Blindness were the following:

Francis M. Forster, M.D., certified by American Board of Psychiatry and Neurology 1943; chief of department of neurology and dean of University of Georgetown School of Medicine.

Clinton N. Woolsey, M.D., Charles Sumner Schichter research professor in neuro-physiology, University of Wisconsin Medical School.

Jacob Yerushalmy, M.A., Ph.D., professor of biostatistics, University of California School of Public Health.

# DIABETIC AND VASCULAR RETINOPATHIES

I. S. TASSMAN, M.D.

Attending Surgeon  
Wills Eye Hospital, Philadelphia

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The occurrence of retinopathy in diabetes is apparently related to the duration of the systemic disease. Cooperation of the patient in prescribed treatment and frequent exchange of reports by attending physician and ophthalmologist are important control factors.\*

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FIFTY years ago, when the National Society for the Prevention of Blindness was founded, patients suffering with the diabetic form of retinopathy were not encountered as frequently as now. Blindness was therefore not as common a result. Since insulin has served to prolong the life of the diabetic the incidence of retinal complications in the eyes of these patients has increased considerably, and as a result loss of vision and blindness have increased. With few exceptions the incidence of the ocular complications has a very close relationship to the duration of the disease. It is generally recognized that cataract and also retinal damage are more common in diabetics than in non-diabetics of the same age groups. The retina in particular is known to be very susceptible.

Early in the course of this disease no signs of retinal involvement may be evident; but if the case is observed closely and regularly over a period of time one or two small petechia or tiny hemorrhages may appear in the retina. With progress of the disease

the hemorrhages may be larger and in some of long standing, extensive hemorrhage into the vitreous may occur.

## Vascular Pathology

During recent years knowledge of the vascular pathology has been advanced somewhat by studies of flat preparations of the retina from these cases. By employing a new carbohydrate staining method it has become possible to examine the entire vascular system of the retina and thereby obtain a better understanding of the picture of diabetic retinopathy. The work of several investigators revealed that small microaneurysms occur in the retina of diabetic eyes, the sacs of which are lined with epithelium and connected with the capillaries. These capillary aneurysms are so common in diabetic retinopathy that, together with the surrounding exudates and hemorrhages, they present a characteristic picture of the disease.<sup>1</sup> Many of these aneurysms are found to have thin walls, while in others the walls are thick and hyalinized. The walls may even become so thick that the lumen is almost obliterated. Since the aneurysms are often surrounded by

\* Presented at the 50th Anniversary Conference, National Society for the Prevention of Blindness, Philadelphia, March 13, 1958.



a group of small hemorrhages and exudates they probably develop at weak points in the vessel wall.

Kimmelstiel-Wilson disease or glomerulosclerosis may occur in the more advanced stage of diabetes. In this condition intercapillary microaneurysms are found at autopsy in the glomeruli of the kidneys. The retinal aneurysms are no doubt manifestations of the same vascular process, but the retinal disease in diabetes probably precedes the renal lesions. The clinical diagnosis of Kimmelstiel-Wilson disease can be assumed in the presence of a diabetic retinopathy in a patient about 50 years of age or over with vascular hypertension, edema and albuminuria. Neither the retinal nor renal lesions are seen characteristically in non-diabetics who may be suffering with atherosclerosis or malignant hypertension, although the diabetic patient may develop both of these conditions.

When hypertension is also present in the diabetic the retinal lesions may be mixed. Evidences of hypertensive and arteriosclerotic changes may be observed in the retinal vessels and additional hemorrhages which are superficial, streaked or linear may also be seen, usually located close to the retinal vessels. Edema may also occur in the retina, and in late cases may become quite marked in and around the optic nerve head. In these advanced cases the vision may become quite impaired.

#### Time of Onset

The ophthalmologist is usually at a disadvantage in determining the time of origin of the retinopathy, since many of the patients who come under his observation for the first time may

have had the ocular involvement for an undetermined period. It might be possible to determine the duration of the systemic disease but not always the duration of the ocular changes. For this purpose patients must be studied and observed regularly from the time of onset of the disease by both the internist and the ophthalmologist.

In many cases in routine practice satisfactory cooperation between the patient, his physician and the ophthalmologist is difficult to maintain. In my own experience many patients fail to visit their physicians frequently enough. This is especially true if they feel well and are told that their last blood sugar reading was within normal limits or "not too high." In many instances diabetic patients will knowingly fail to maintain the diet prescribed for them. If they are on insulin therapy which they administer themselves they may carry this out rigidly enough but at the same time neglect a prescribed diet. This may continue over an indefinite period of time during which certain accompanying changes in the vascular system progress.

The Joslin group, who had the opportunity of comparing the course in these cases today with that of a generation or more ago, has noted the increased incidence of vascular changes and retinal lesions, but they are nevertheless convinced that patients who are properly managed and who adhere rigidly to treatment show the least number of vascular lesions. Some of their cases in children which were severe at onset remained free of arteriosclerotic lesions after 25 years or more of the disease. But some investigators like Dolger felt that all



diabetics must develop vascular damage after 25 years of the disease, regardless of the treatment. Others feel that the incidence of ocular complications increases with the duration, although good control of the disease has been found to modify the severity and progression of the lesions.

I have observed a number of cases with a duration up to 25 years or more. In a few of long standing the retinal lesions were either absent or at a minimum, regardless of the kind of control, while a few of those of shorter duration did have some degree of retinopathy. In general, however, it is my own feeling that proper management and regular, consistent treatment in the majority of cases will prevent or keep the retinal lesions at a minimum. It does seem, however, that the occurrence of the retinopathy is related to duration of the disease, not to its severity at a particular time.

#### Related Factors

Attempts at direct treatment of the retinopathy have thus far been without satisfactory result. This is to be expected, since sufficient knowledge has been lacking with regard to the etiologic factors responsible for the pathologic eye changes. These still remain to be revealed. However, the related function of certain body mechanisms has been recognized and studied with a little progress in recent years. The state of the autonomic nervous system, function of the endocrine system and effect of constant emotional stress in these patients may prove to be factors in the etiology. Future research may provide important information, and more effective means of prevention.

Many patients suffering with dia-

betes and vascular hypertension belong to a group who are subject to various forms of emotional stress and strain. This introduces the question of the eventual effect of such continued stress on the secretion and blood levels of steroids in these cases. It is known that these compounds increase blood sugar and liver glycogen, aid in conversion of protein to carbohydrate, mobilize fat and increase renal clearance of uric acid.

The effect of the adrenal cortical function under various conditions in relation to the retinopathy of diabetes and Kimmelstiel-Wilson lesions has been studied to some degree. Lesions very similar to those of Kimmelstiel-Wilson were produced in rabbits by daily injections of cortisone for two weeks. These typical lesions have also been found in non-diabetics who had received long and intensive treatment with corticotropin (ACTH). This led Becker<sup>2</sup> in collaboration with Friedenwald to investigate the level of adrenal cortical function in diabetics with and without retinopathy. Their results seemed to support the hypothesis that the vascular lesions of the diabetic may be due to some interaction between the diabetic abnormality and adrenal cortical function. It does seem probable, as pointed out by Goodman<sup>3</sup>, that the retinopathy results from a metabolic disorder characterized by a hormonal imbalance. This could be explained as the effect of a constant stressing agent on the function of the autonomic nervous system which in turn would affect the function of the endocrine system with increased secretion of hormones or hormone-like substances, finally resulting in increased secretion and blood levels of steroids.

Cortisone and ACTH apparently cause a depletion also of vitamin B<sub>12</sub>.<sup>4</sup> If this occurs in the diabetic with retinopathy it will be interesting to study the effects of intramuscular administration over a period of time in these patients.

It has also been found that with the administration of ACTH the diabetic condition is accompanied by a decrease in concentration of blood glutathione which is essential to normal internal metabolism. Conn et al.<sup>4</sup> administered large amounts of glutathione intravenously and reversed the hyperglycemia and glycosuria produced in a young man by the administration of ACTH.

#### Direct Treatment

The results of direct treatment of diabetic retinopathy obtained by Sasaki et al.<sup>5</sup> several years ago by the administration of testosterone have not been confirmed by others. Multivitamins, rutin, methiscol (with vitamin B<sub>12</sub>), C.V.P. (with ascorbic acid) and hesperidin (with ascorbic acid) are being employed in many cases principally to improve and retain the integrity of the blood vessels. Such preparations as adrenosen and the lipotriads are being recommended for preventing the occurrence and promoting the absorption of retinal hemorrhages. Some benefit might be obtained from these in earlier cases, but their ultimate effect is also difficult to evaluate until after they have been employed in the individual case over a sufficient length of time.

Reports have appeared in the literature concerning results obtained by hypophysectomy and adrenalectomy in patients with progressive and advanced diabetic retinopathy. Improve-

ment of the condition was noted in a few patients, but at the present time the treatment appears to be radical and is still in the stage which should be called clinical and experimental investigation.

#### Summary and Conclusion

The occurrence of retinopathy in diabetes is apparently related to the duration of the systemic disease. Proper and adequate treatment of the disease from its very beginning should certainly be carried out. There is evidence to show that this will have a tendency at least to minimize the occurrence of retinal lesions but, regardless of belief, the control of the diabetic state is the least one can do in an attempt to prevent the retinopathy.

Greater cooperation on the part of the patient under routine care is desirable, and a better liaison between the physician treating the case and the ophthalmologist is recommended.

The average patient should visit his physician more frequently and more regularly from the beginning. After each visit reports should be exchanged by the attending physician and the ophthalmologist regarding blood sugar concentration, general condition and ocular condition of the patient. In this way a better correlation can be obtained between the systemic and ocular conditions.

The preparations mentioned which are now available for the treatment of retinopathy should be employed.

A little progress has been made in the past decade in relation to some factors which may affect certain individuals in the occurrence of diabetes and the subsequent development of retinopathy. These include especially emotional and other forms of stress;

function of the autonomic nervous system; function of the endocrine system; and their relationship to each other.<sup>6</sup>

Vascular changes occur especially in the smaller and terminal vessels during the course of diabetes over a period of years. The exact chain of events as well as specific factors responsible for the occurrence of ocular and retinal lesions in these patients are still unknown. Continued observation and study of the disease and further research are needed.

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#### CONGRATULATIONS TO WHO

The World Health Organization, which celebrates its tenth anniversary this year, has probably helped more people on less money than any international group in the world. On a 1958 budget of \$13,500,000 contributed by the 88 member states, WHO goes about its stupendous task of raising the health level of the world, and eradicating every infectious disease with a known cure.

About 600 delegates and advisers from all over the world attended the recent sessions of the WHO governing body in Minneapolis. At these annual meetings general policies are outlined for the guidance of WHO's staff of about 1,000 professionals of 54 nationalities, directed from headquarters in Geneva, Switzerland.

The drive against trachoma, which has been followed in these columns, is only one of the WHO programs which have already had tremendous success.

Any member nation with a health problem can call upon WHO for expert medical advice, field workers, and special research and pilot studies. WHO works with national health services to prevent infectious disease, and warns of any outbreak of epidemics from short-wave stations at various posts on the globe. It trains health workers, coordinates research, and publishes the reports of special committees such as the Expert Committee on Trachoma. It is helping a hundred countries improve sanitary conditions. International standards for drugs and vaccines, and international sanitary regulations to replace the quarantine measures which hamper world travel are now in force.

# OPTICAL AIDS FOR LOW VISION

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A new type of strong lens and new charts for testing low acuity are significant developments of the past year.\*

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IN THE past five years there has been increasing interest in the use of optical aids for persons with low vision. I will not attempt to review the excellent reports of Fonda, Linksz, Kestenbaum, Sturman, Gordon and Ritter, Lebensohn and others, but rather to outline the newer developments in this field, and to present an opinion based on personal experiences with these aids.

## New Devices

During the past year the Conoid Lenses developed by David Volk, M.D., of Western Reserve University have become available. These are made of crown glass and may be used monocularly or as hand magnifiers. They range in power from 15 to 100 diopters. They are designed to incorporate the spherical and cylindric corrections in powers under 40 diopters. They reduce the aberrations which make ordinary spherical lenses unsatisfactory, thus providing a larger and clearer field than ordinary spherical lenses of similar power. These lenses fit the standard metal or plastic frames and are designed to be worn 10 mm. from the cornea. Moreover, standardized testing sets are now

available which utilize the currently used trial frames.

Volk's suggested method of prescribing these lenses is to determine the visual acuity and divide the denominator of the Snellen Fraction by 10.

$$\text{Suggested Power in Diopters} = \frac{\text{DENOMINATOR OF SNELLEN FRACTION}}{10}$$

$$\text{e.g., Visual Acuity} = 20/400$$

$$\text{Lens Power} = \frac{400}{40} = 10 \text{ Diopters}$$

This method of determining the lens power is scientifically inaccurate, but it is practical and it does have the advantage of simplicity in that neither excessive mathematical calculations nor special manuals or tables are required.

In our experience these lenses have the same disadvantage as other strong lenses—namely, any lens of 40 diopters or any device of X10 magnification has a focal distance of 2.5 cms. (one inch), and therefore the eye-to-hand distance is very short. However, we have ordered Conoid Lenses of high power (40 D and 60 D) for patients who have previously rejected similar magnification in other devices. These patients report that they see more words and more letters than with other good microscopic lenses. They have stated that the distortion is much

\* Presented at the 50th Anniversary Conference, National Society for the Prevention of Blindness, Philadelphia, March 13, 1958.

less, and that the Conoid Lenses are more comfortable.

### New Charts

During the past year the Keeler manual with the new Keeler test charts has been in wider use. The Keeler charts are designed for near and are much easier to use and interpret than one would imagine on first glance. The test letters are designated by "A" and "N" notations. The patients are tested and a chart tells directly which magnification is required. From these charts one can convert the visual acuity into the metric and Snellen equivalents.

New reading charts have also been devised by Louise L. Sloan, Ph.D., at Wilmer Institute in Baltimore. These are for use at a testing distance of 40 cms. (16 inches), after which the power of accommodation is determined. Our principal objection to these is the testing distance. The standard AMA testing distance for far is 20 feet or six meters, and the standard near testing distance is 14 inches or 35 cms. For uniformity we feel all tests, therefore, should be performed at this distance.

The Braille Institute of America, Los Angeles, has recently published *Optical Aids for Low Acuity* by Russell L. Stimson. This manual consists of a series of new test targets. The testing distance is the accepted 35 cms. Testing appears easier with these targets than with charts consisting of words, letters or numbers, especially for patients with markedly subnormal vision. The manual also includes numerous cards with letters and words, and a table which facilitates the determination of the proper power lens. The latter is valuable for those

who wish to avoid mathematical calculations. These calculations are not difficult, and for those who prefer to work directly from their test findings Stimson's formula is presented.

New Reading Distance =

$$\frac{\text{V.A. at Test}}{\text{V.A. Required}} \times \text{Testing Distance}$$

e.g.,—Assume a patient with poor vision sees the 35/326 target.

To read newspapers, V.A. required is 14/34 inches or 35/87 cms.

$$\text{Therefore, } \frac{326}{87} \times 35 = 9.35 \text{ cms. = New Reading Distance}$$

Dioptic Power of Lens Required =

$$\frac{1}{f} = \frac{1}{.93\text{M}} = \frac{10.7 \text{ D Lens}}$$

From the formula (or chart) we know that in order to read newspaper print this individual would require an additional lens of + 11.00 D power. The examiner has a choice of ordering any device which will afford a +11.00 D or a magnification of X 2.75.

Stimson has compiled a valuable list of all devices currently available and their source.

### Experience at Wills

A Low Vision Department has been in operation at the Wills Eye Hospital for three years. Patients are referred to this department after the following routine: complete ophthalmologic examination; screening in the refraction department (adds up to + 4.00 are ordered here); screening by our social worker, Miss Eleanor Thompson.

The Volk Conoid Lenses have been available to us since October 1957; and since January 1958 the Stimson manual and charts have been used and compared with the Keeler and Lebensohn charts. Our findings will be summarized briefly.

During this period we have interviewed and tested 34 patients between seven and 84 years of age. Of these, 15 had devices ordered for near: Volk Conoid Lenses were ordered for five; six were benefited by strong reading glasses (up to +10.00 adds); four preferred a 10 X illuminated magnifier; and the youngest patient the 5 X AO Projection Magnifier. Three of these 15 also had distance devices ordered, the 2.75 X Sportsopes, which they found satisfactory.

We have seen over 200 patients since the establishment of our clinic. Expensive telescopic lenses were ordered on just two occasions. During this period three patients have given us their Feinbloom telescopic lenses (ordered elsewhere); and we have seen eight other patients who use their telescopic spectacles with the reading caps in place only for near vision. Another 15 patients have been using the 10 X Penlite telescope in the street with apparent success.

We feel we can learn much about optical aids from patients who come in with the weirdest devices, such as triplets and linen testers mounted in spectacle frames, and binoculars with home-made adapter rings for holding lenses for reading.

Generally speaking our findings and experiences parallel those of Fonda and Lebensohn—namely, that more patients are helped with strong reading corrections than by any other device. The next most commonly useful device is the doublet or triplet lens as well as the AO, Univis or Policoff lenses. In our opinion, however, these will be supplanted by the Volk Conoid Lenses.

It is our feeling that further investigation should be directed towards de-

termining the psychological factors which lead some patients to accept these devices but more to reject them. This work should be an ancillary service of eye centers and blind institutions, since it requires the cooperation of the eye physician to diagnose and equate the problem, as well as that of the social worker and the optician. A psychologist would be most helpful. Most important is the financial aid required, since most of these individuals are unable to pay for these devices.

#### Summary

Contributory progress directed towards aiding persons with low vision during the past year has consisted of:

1. The development and the availability of a new type of strong lens—the Volk Conoid Lenses.
2. The development of new charts for vision testing, the most promising of which are those devised by Stimson.

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#### SHOULD EYE PATIENTS FLY?

Some eye patients should fly only under controlled conditions, Major Charles A. Berry says in *Aviation Medicine* for January 1958. The author, who is attached to the School of Aviation Medicine, Randolph Air Force Base, points out the dangers of both hypoxia and gas expansion in eye cases. "The injured or postsurgical eye may have air injected in the anterior chamber to reform it," he writes. "Flight at low altitudes or in pressure cabins is necessary to prevent gas expansion." Above 10,000 feet the lack of oxygen dilates the retinal and choroidal vessels and causes a rise in intraocular tension and a decrease in pupil diameter. Since the retina has the highest oxygen demand of any body tissue, some patients with eye conditions should have oxygen or cabin pressurization above 4,000 feet.



# Oxygen Administration to Premature Infants in Connecticut Hospitals

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and

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A recent study shows a marked decline in incidence of severe retrolental fibroplasia, but less severe cases are still developing in premature nurseries. The authors make specific recommendations for strict supervision and control of oxygen administration.\*

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IT IS now well known that oxygen administered to premature infants over long periods of time and in excess of 40 per cent concentration may result in retrolental fibroplasia. Even in concentrations below 40 per cent and for short periods some degree of cicatricial RLF and visual reduction has been observed.

Data accumulated in a premature infant follow-up outpatient clinic, which has been in existence in Hartford Hospital since 1948, would indicate that retrolental fibroplasia is usually recognized and reported to the State Board of Education of the Blind by any physician only when the child has markedly reduced vision in both eyes or is blind from the disease. In Hartford Hospital all infants of a birth weight of five pounds eight ounces or less who survive have at least one examination of the ocular fundi by the ophthalmologist in charge of the premature infant follow-up outpatient clinic; and upon discharge from the hospital are referred to this

clinic. Some infants who showed normal ocular fundi or slight retrolental fibroplasia while in the hospital are found on subsequent examination in the clinic to have markedly impaired vision. Other similar cases are being discovered in the routine private office practice of the physician conducting the clinic. These cases were not known as RLF by the physician in charge or the parents of the child.

In December 1955 a questionnaire was sent to all Connecticut hospitals that give care to premature infants, requesting information regarding the equipment and controls used for the administration of oxygen to infants. Although the information derived was incomplete and not entirely accurate, it was learned that (1) some hospitals were making no effort to control the administration of oxygen to premature infants; (2) some hospitals were administering oxygen with controls that were inadequate; (3) some were not aware that any cases of RLF had ever originated in their buildings; (4) some felt that RLF was no longer occurring in their nurseries. The size of the hospital, the qualifications of the medical

\* This report also appears in *Hospitals*, Journal of the American Hospital Association, issue of June 16, 1958.



and nursing staff or the type of equipment appeared to be not necessarily an influencing factor in the number of cases of RLF emanating from premature nursery units of the 35 hospitals in Connecticut.

**Cases of RLF Reported in Connecticut**

| Year Reported | Premature Births | RLF Cases* |
|---------------|------------------|------------|
| 1948          | 1,900            | 26         |
| 1949          | 1,751            | 24         |
| 1950          | 1,337            | 19         |
| 1951          | 1,981            | 34         |
| 1952          | 2,548            | 37         |
| 1953          | 3,041            | 52         |
| 1954          | 3,372            | 26         |
| 1955          | 3,308            | 7          |
| 1956          | 3,644            | 5          |
| 1957          | 2,826            | 6          |
|               | 25,708           | 236        |

\* By year of birth, not the year reported.

This table shows a marked recent decline in the incidence of RLF. There is an actual decrease in incidence, but it seems to the writers that this is not as dramatic as it appears because there is a lag in discovery and in reporting. Especially in the hospitals where the eyes of prematures are not examined, the disease may not be discovered until the child enters school, if it is not very severe. Some prematures have undoubtedly moved from this state before RLF was discovered, and have not been reported to the Connecticut Board of Education of the Blind. During the period shown in the above chart 15 RLF children were born elsewhere who are now Connecticut residents and registered with the Connecticut Board of Education of the Blind. These are not included in the chart. We would estimate that there are a great many more Connecticut children who are visually affected by

RLF but not so severely as to be legally blind. These have not been reported either because the visual handicap has not been discovered, or the nature of the ocular pathology has not been recognized by the examining physician. The incidence of severe RLF has definitely decreased in this state, but many less severe cases are still developing in our premature nurseries.

#### **Reason for Study**

This study was undertaken to determine the methods that are now being employed in Connecticut hospitals to control the administration of oxygen to premature infants, in an effort to reduce the number of cases of visual impairment due to retrolental fibroplasia. During the first six months of 1957 each of the 35 hospitals licensed to care for newborn infants was visited. The study was confined primarily to examination of equipment and procedural methods. Every effort was made to talk with the hospital administrator; the nurse in charge of the premature nursery; nursing personnel actually giving care to premature infants; personnel servicing and inspecting oxygen equipment, such as engineers and anesthetists; members of the resident staff, pediatricians and ophthalmologists. Each hospital has been sent a report of the findings and recommendations for that particular institution.

#### **Incubators**

With adequate controls it was felt that all the incubators in use in the hospitals could be safe for the administration of oxygen. The 260 inspected were of the following types: Gordon Armstrong, 159; Gordon Armstrong Mark III, 23; Isolettes, 67; others, 11.

### Oxygen Control Equipment

The method for controlling oxygen delivered to the incubator varied in the different hospitals and with different incubators within the hospitals.

Flow meters were used to regulate the rate of flow of oxygen in all but two small hospitals which used no controls, and were the only method of control in 16 hospitals. Both flow meter and mixing valves were used to regulate oxygen concentration in 17 hospitals. No hospital used a mixing valve without a flow meter. Although only 17 hospitals were using mixing valves, 11 others had them available in the nursery or storeroom but were not using them because they were felt unnecessary or not understood by hospital personnel. There were 106 mixing valves in use or available for use in 28 of the 35 hospitals. These were distributed as follows: 26 Gordon Armstrong, 40-100 per cent adjustable; 5 Gordon Armstrong, 40 per cent fixed; 21 Melco, 40-100 per cent; 44 Melco, 40 per cent fixed; 6 Vapojets (special attachments to the Isolette); 1 E&J Mfg.; 1 Oxygen Equipment Mfg.; 1 Baby Haven and 1 Penn 600.

### Flow Meters

Tests were made on some of the incubators on which flow meters alone were used to control oxygen concentration, to determine concentration at various levels in the incubator with different rates of flow as indicated on the flow meter. In incubators tested, except for the Vapojet in the Isolette, the oxygen was introduced through an opening near the bottom and at one end. In all the incubators which had adjustable air vents tests were made with vents closed. For all tests a Beckman oxygen analyzer was used, with

its tube introduced through a small hole or through a vent opening with the rest of the opening taped.

In incubators in which 100 per cent oxygen was introduced at 2-3 liters per minute, without a mixing or reducing valve, the highest concentration and the fastest build-up of oxygen, regardless of the type of incubator, was at the bottom and near the oxygen inlet of the incubator. After 30 minutes the concentration near the inlet was near 40 per cent; in one hour it went over 50 per cent. At the other end of the incubator or at a higher level the concentration rarely went over 40 per cent.

At 4-5 liters of oxygen per minute flowing into the incubator for a period of 30 minutes the oxygen concentration at the bottom of most of the incubators tested ranged between 50 and 70 per cent. However, at the higher rates of flow there was less tendency to layer oxygen and the concentrations at different levels of the incubator tended to be similar, probably because of better mixing of incubator atmosphere with the greater speed of flow.

If the inlet was at the end of the incubator near the heating element, or at a higher level in the incubator, there was less tendency to layer oxygen. It was interesting to discover that in an open Hess Bed, with oxygen flowing in at 2 liters per minute, the oxygen concentration at the bottom of the bed was 42 per cent in 5 minutes; at 5 liters of oxygen per minute the concentration under the same conditions was 70 per cent. With the Hess Bed closed, and oxygen flowing into the incubator at 2 liters per minute, the oxygen concentration was 85 per cent in 5 minutes.

In a closed incubator without an oxygen mixing or reducing valve it was demonstrated that at any rate of flow the concentration in the incubator is directly proportional to the time given, with the highest at the bottom.

Flow meters were not tested for accuracy during this survey, but should be tested with a back-pressure compensated device.

In 18 of the 35 hospitals the rate of flow of oxygen through the flow meter was established at 1-3 liters per minute; in 10 hospitals the rate of flow was established at 3-4 liters per minute; and in 7 there was either no established rate or the personnel did not know what it should be.

In 18 hospitals 100 per cent oxygen tanks were kept in the nursery, and in 15 hospitals 100 per cent oxygen was piped in from tanks elsewhere in the hospital or from the yard. In 2 hospitals 100 per cent oxygen was manufactured and piped into the nursery. In none was there an already prepared mixture of 40 per cent oxygen with other gases being used.

#### Mixing or Reducing Valves

Mixing valves were tested by allowing oxygen to flow through the valve with the flow meter set at different rates of flow. The tube of the oxygen analyzer was placed at the valve inlet in the incubator. If properly set at 40 per cent, the mixing valve should deliver to the incubator oxygen not over 40 per cent.

Three 40-100 per cent Gordon Armstrong valves were found to be set so that at the 40 per cent reading they delivered 100 per cent and vice versa. One Melco 40 per cent fixed-type valve used on an Isolette with a 4-liter

oxygen flow reached 45 per cent oxygen concentration in 20 minutes. It was learned that the valve had been cleaned and reassembled incorrectly. The Isolette incubators, even with the float taken out of the intake without an additional reducing valve, usually delivered over 40 per cent at a rate of 3 liters per minute. Using the Vapojet as a mixing valve at the #1 opening and below a 5-liter oxygen flow, the concentration within the incubator was 30-35 per cent; at #2 opening 33-38 per cent; and at #3 opening 37-45 per cent. At any rate of flow using a mixing valve there was less tendency to concentrate oxygen at the bottom of the incubator than when not using a mixing valve. Whether or not fluid was used in the nebulizer bottle made little difference in the oxygen concentration delivered.

#### Nebulizers

Two-thirds of the incubators equipped with mixing valves also had nebulizers as part of the mixing device. Three hospitals used air compressors to obtain high humidity in the incubator without simultaneous delivery of oxygen into the incubator. The types of air compressors were Air Shield, DeVilbiss and Eliot.

#### Oxygen Analyzers

Oxygen analyzers were in use in 32 of the 35 hospitals; an analyzer was kept in the nursery in 28. Some hospitals had more than one analyzer. All analyzers were tested with atmosphere, with 100 per cent oxygen, and at various oxygen concentration levels against the Beckman analyzer. It was found that 9 of the 14 Beckman, 5 of the 16 Mira, and 2 of the 4 OEM devices were in good working condition.

## Procedures

Oxygen was given routinely to all premature infants in 6 of the 35 hospitals. In the other 29 it was given on a need basis; indications usually were cyanosis, atelectasis, hyaline membrane disease and congenital heart disease.

In 23 hospitals there was an attempt to keep the oxygen concentration under 40 per cent, but in 12 there was no definite attempt at percentage control. In 13, oxygen had to be ordered by a physician-anesthetist, pediatrician or house staff. In 14 the nurses initiated oxygen therapy, and in 8 it might be either. In 4 hospitals there were standing written orders regarding oxygen therapy to premature infants.

Oxygen analysis of incubator atmosphere was done every 4 hours or more frequently in 11 hospitals; at least every 8 hours in 10; once daily in 1; rarely in 4; never in 7; and not known by the personnel at the time of this survey in 2. The analysis was done by the nursing personnel in 23 hospitals, and by an engineer, therapist or anesthetist in 4. In one it was not known who did the analysis.

A record of the concentration of oxygen and the length of time it was given was kept by 12 hospitals.

The personnel of one hospital expressed the belief that with high humidity oxygen need almost never be used in the treatment of premature infants. High humidity by means of a nebulizer attached to the mixing or reducing valve was used routinely in 10 hospitals and frequently in 3.

The ocular fundi were examined with a mydriatic in 16 of the 35 hospitals. In 21 the premature infant was examined at least once by an ophthalmologist before discharge; in 3 the ex-

amination was done by other personnel; and in 11 the ocular fundi were never examined.

## COMMENTS

Any of the standard makes of incubators is safe for the care of a premature infant, provided: (1) a reliable back-pressure compensated flow meter is used; (2) oxygen flow is kept at 2 to 3 liters per minute (if flow is less than 2 liters per minute, insufficient air is sucked in by the Venturi valve and oxygen concentration delivered may be too high); (3) a reliable fixed-type reducing valve is used which is cleaned and checked periodically; (4) incubator atmosphere is analyzed frequently enough to discover promptly defects in the mechanical devices employed.

Criteria for the selection of a reducing valve are: (a) valve is easily attached to incubator; (b) Venturi opening is nonadjustable; (c) oxygen delivered does not exceed 40 per cent regardless of rate of flow; (d) a flow meter in which gauge is not influenced by atmospheric pressure is attached to valve; (e) humidity or temperature has no effect upon oxygen delivered through valve; (f) a nebulizing device for use when humidity is desired is a part of the valve mechanism; (g) valve is so constructed that it does not get out of order easily.\*

Oxygen should not be used routinely even for small prematures. Small prematures are most susceptible to damage from oxygen, even at less than 40 per cent concentration, if for long enough periods, or over 40 per cent for

\* The Melco 758A, 40 per cent fixed Venturi mixing device with pressure reducing valve R5, back pressure compensated flow meter R7, water bottle, and green pressure tubing satisfies the above criteria.

## Oxygen Analyzers

| Features  | Beckman | Mira | OEM  |
|---|---------|------|------|
| Accurate—when adjusted . . . . .                    | Yes     | Fair | Fair |
| Adjustment necessary for each use . . . . .         | No      | Yes  | Yes  |
| Easy to read . . . . .                              | Yes     | Yes  | Yes  |
| Dehydrating salt visible . . . . .                  | Yes     | No   | No   |
| Dehydrating salt easily replaced or dried . . . . . | Yes     | No   | No   |
| Fragile . . . . .                                   | Yes     | Yes  | Yes  |
| Return to factory necessary for repair . . . . .    | Yes     | Yes  | Yes  |
| Battery replacement easy . . . . .                  | No      | No   | No   |

very short periods. Withdrawal from oxygen need not be gradual; and it is best that it not be gradual when it is demonstrated that oxygen is no longer required to preserve the life of the infant. If there are early signs of RLF, the infant should not be put back in oxygen on this account. It should be used only for a definite need and with frequent trials without it. Written specific orders regarding oxygen therapy to prematures should be posted and enforced in every nursery. A special chart for oxygen therapy should be placed in each premature infant record when oxygen is given; and the liter flow per minute, the measured concentration of oxygen and the time of beginning and stopping flow should be noted.

With our present knowledge of the relationship of oxygen administration and RLF, there is little justification for the use of this potent agent without specific incontrovertible indications of anoxia. It is true that RLF has occurred in either premature or term babies without administration of any supplemental oxygen. However, physicians and hospital administrators should be aware of the possible medicolegal significance of oxygen therapy.\*

\* Reports of legal action in Chicago and New York have appeared in the newspapers.

The precautions in oxygen administration for prematures are not necessary for term infants.

Analysis of incubator oxygen should be made at the end of the first half-hour of each time the oxygen is turned on and thereafter at least every 8 hours in long periods of administration. The Beckman analyzer seems very satisfactory for nursery personnel because no adjustments are necessary. It is easy to read and not likely to get out of order. The battery has to be changed periodically. The dehydrating salt when turned from a blue color to purple should be dried out or changed. The rubber suction bulb should be replaced when the rubber becomes old or the valve does not function. The tube inserted in the incubator should be long enough to reach to the bottom of the incubator near the baby's head, where the sample should be taken. The analyzer should be kept in the nursery and nursing personnel should be instructed in its use. Hospital personnel having supervision of oxygen therapy apparatus should inspect the analyzer once a week.

There is great variation in hospitals in regard to the humidity desired. Investigation is suggested to determine whether high humidity without oxy-

gen can sometimes supplant high humidity with oxygen. If nebulizers are used and oxygen not also required, compressed air should be used for nebulization rather than oxygen.

All nursery personnel and physicians having under their direction the care of prematures should be instructed in the use and dangers of oxygen therapy in prematures, the principles of construction of flow meter, Venturi valves, nebulizers, incubators and oxygen analyzers. They should also know how to use each of these pieces of equipment in the nursery. Supervisory personnel should be sure that the equipment is clean and in good working order.

Early stages and mild degrees of RLF can be missed unless seen at the right time. The eyes of all prematures should be examined at least once a month until at least three months of age because of the greater probability of developing the disease. It has been the experience at Hartford Hospital that without a mydriatic the fundoscopic examination is unsatisfactory and practically useless in premature infants.

#### SPECIFIC RECOMMENDATIONS FOR HOSPITALS

1. A 40 per cent fixed-type mixing valve should be attached to each incubator in the premature nursery and used for oxygen therapy.
2. A satisfactory back-pressure compensated flow meter should be attached either to all oxygen outlets or in front of the mixing valve.
3. An oxygen analyzer should be kept in the premature unit of the hospital.
4. An air pump or other compressed air device should be used for high incubator humidity when oxygen is not required as well.
5. Oxygen should not be administered routinely to prematures of even small birth weight.
6. Oxygen concentration in premature incubators should not exceed 40 per cent unless specifically indicated and ordered in writing by the supervisory physician.
7. The flow of oxygen should be kept between 2 and 3 liters per minute unless ordered otherwise by the physician for a specific need.
8. Oxygen should be discontinued after 24 hours unless reordered in writing by the physician.
9. The flow meter setting, the concentration of oxygen desired, and the indications for use of oxygen should be ordered in writing by the physician on the baby's chart.
10. The flow meter setting, the concentration of oxygen, and the length of time given should be recorded on a special sheet on the baby's chart, to become a part of his permanent record.
11. There should be standing written orders for administration of oxygen to premature infants which include these procedural recommendations.
12. Incubator oxygen analysis should be made at the end of the first half-hour of each time oxygen flow is started, and then every 8 hours during administration.
13. The oxygen analyzer should be checked for accuracy once a week by personnel in charge of maintenance of oxygen therapy.
14. Hospitals should insist that manufacturers or their representatives install incubators, flow meters and



mixing valves, and instruct hospital personnel in the use of the apparatus.

15. All premature nursery personnel, including nurses, house staff and any physician allowed to treat premature infants in the hospital should be given theoretical and practical instructions in flow meter, mixing valves, oxygen analyzers, and the uses and dangers of oxygen therapy in premature infants.
16. All premature infants 5 pounds 8 ounces or under should be examined at least once a month under a mydriatic, by an ophthalmologist, preferably the same one, until discharge from hospital.
17. The inspection of oxygen therapy equipment and procedures in premature nurseries should be part of the examination by representatives of the Bureau of Maternal and Child Hygiene of the Connecticut State Department of Health.

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#### HOME STUDY COURSES

The 1958-1959 Home Study Courses in the basic sciences related to ophthalmology and otolaryngology, offered as a part of the educational program of the American Academy of Ophthalmology and Otolaryngology, will begin on September 1 and continue for a period of ten months. Detailed information and application forms may be secured from Dr. William L. Benedict, the executive secretary-treasurer of the Academy, 15 Second Street, S. W., Rochester, Minnesota. Registrations should be completed before August 15.

#### WHAT "PUPIL" MEANS

The term *pupil* comes from the Latin *pupilla*, a little girl, or a doll. Evidently the Romans thought of a doll when they saw the tiny image of themselves in the pupil. As for *myopia*, it comes from the Greek *myein*, to close, and *ops*, eye. The ancients noticed that nearsighted people narrow their eyes when looking at a distant object. These derivations are explained by Dr. J. E. Schmidt in *Medical Science*, Aug. 25, 1957.



# PRESCHOOL VISION SCREENING IN LOUISVILLE

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Teams of Delta Gamma volunteers have performed  
this service efficiently during the past two years.\*

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THE two primary objectives of preschool vision screening are the early detection of suppression amblyopia and major refractive errors. The usual course of events is that a child is referred for an eye examination after he has entered school. The parents may then be notified that their child has defective vision in one eye. They become alarmed because he has never complained of visual difficulties and apparently can see quite well. He has had numerous physical examinations and no mention has been made of eye abnormality.

All too often after the ophthalmological examination is completed the parents become increasingly confused because the vision cannot be corrected by lenses alone, and the normal eye must be occluded. This presents a major problem, especially when a child of six or seven who is adjusted to clear one-eyed vision is suddenly deprived of it. In many instances occlusion creates a major emotional disturbance and must be discontinued. Thus these children will go through life with only one good eye. If vision tests are given at age

three to four this serious condition can be avoided.

Suppression amblyopia is a form of monocular blindness that is reversible and the reversibility is directly proportional to the length of time it has existed. Treatment by occlusion is accomplished with comparative ease in a young child and the length of time required for complete occlusion is much less.

## Refractive Errors

The second objective is the early discovery of major refractive errors in a child at a time when the retina and macular areas are developing and enabling him to interpret detailed vision.

In many cases after a child is enrolled in school his teacher reports to his parents that the child is not making progress in learning to read; thus it appears he is having difficulty with his vision. When he is examined it is discovered that he has a major refractive error and has never learned to see properly. The eyes cannot produce a clear, definite image to be interpreted by the cortical centers. If these visual defects had been discovered when the eyes were developing detailed vision most of the poor visual habits could have been avoided.

\* Presented at the 50th Anniversary Conference, National Society for the Prevention of Blindness, Philadelphia, March 12, 1958.

## Louisville Program

In the spring of 1955 a Committee of the National Society for the Prevention of Blindness was organized in Louisville. The first project recommended was preschool vision screening. We are fortunate in having in our city a chapter of the Delta Gamma Fraternity, an organization which has an active prevention of blindness program. The local chapter has been associated with us in the orthoptic clinic at General Hospital for the past eight years. When the project was presented to the Delta Gamma members they agreed to sponsor it, provided sufficient volunteers could be recruited. Fifteen were soon enlisted and the National Society sent its nurse consultant to Louisville to conduct the first training class. Subsequent training has been done by Delta Gamma. At present we have 11 teams of three members each, plus seven or eight alternates. Each team visits the ocular motility clinic at General Hospital where the members are taught to perform the corneal reflex test and to measure near-point of convergence. On these visits they are shown all types of crossed eyes.

## Acuity Test

The standards for preschool vision testing are as follows:

The visual acuity of each eye must be compared with the average visual acuity for that age group. Acuity involves the utilization of form sense which is not fully developed in young children. Our experience indicates that in testing children of three to four years of age 15 feet is a good distance, using the 30-foot size test object. For the four to six year groups the dis-

TABLE 1

## Preschool Vision Screening May 1955 to October 1957

|   |             |
|---|-------------|
| Total Screened.....                               | 2,379       |
| Boys.....   | 1,270       |
| Girls.....  | 1,109       |
| <i>Age Group</i>                                  |             |
| 3 years.....                                      | 139         |
| 4 ".....  | 416         |
| 5 ".....  | 1,416       |
| 6 ".....  | 399         |
| 7 ".....  | 9           |
| Referred for professional<br>eye examination..... | 179 (7.52%) |
| Given professional eye<br>examination.....        | 140 (78%)   |

tance is 20 feet, and the 30-foot size test object is used. The characters or test object should be viewed by each eye separately under uniform lighting. We have established visual requirements of 20/30 in each eye for the four to six year group; under four years, 15/30 in each eye.

Portable vision charts donated by the Louisville Lions Club are used. The children are usually trained in the testing procedure by the director of the nursery school or kindergarten before the team arrives. The majority of them respond well to the usual method. There are a few, however, who have difficulty in manipulating their hands and arms to indicate the direction of the test symbols. For this group we have substituted a large E cut in cardboard. The child is instructed to turn this E to match the test symbol. In our experience this is much easier for the child aged three to four to accomplish.

A second variation of the procedure is the use of the series of eight pic-

**TABLE 2**  
**Analysis of Results**

|  | Per Cent |
|--|----------|
| Refractive Errors.....   | 50.      |
| Ocular Motor Anomalies.....  | 20.      |
| Congenital Defects.....  | 3.5      |
| External Diseases.....   | 4.5      |
| - - -  |          |
| Correct referrals—low refractive errors; to observe.....                               | 10.1     |
| Incorrect referrals—vision normal.....   | 7.3      |
| Incomplete examination—by family physician.....  | 2.5      |
| No report of professional examination—wearing glasses<br>from jewelry stores, etc..... | 2.1      |
|  | 100.0    |
| Number.....  | 140      |

tures described by Dr. Henry F. Allen in the *American Journal of Ophthalmology* of July 1957. The recognition facility of these pictures has been made to correspond as closely as possible to that of the 30-foot E. The child is shown all of these pictures. The eyes are tested separately with the examiner standing at 15 feet. If the child can identify four of the six pictures the vision is considered normal. If he cannot identify them the examiner moves closer until recognition is possible. A difference of five feet or more in the vision of each eye is considered to warrant referral for examination. The purpose of this test is to find out whether there is an appreciable disproportion in the acuity of each eye. It is this factor that leads to early amblyopia.

#### Corneal Reflex Test

The corneal reflex test is not usually performed in this type of screening. However, I was interested in determining whether or not properly trained non-professional personnel could carry out this type of

examination accurately. It appears that they can, in view of the number of ocular motility abnormalities that were found in these screenings.

#### Near-Point of Convergence

The test for near-point of convergence is not usually done in pre-school screening, but here again I wanted to see if it could be included. It was limited to children who were about to enter school—the five to six year olds. If faulty convergence is found in a child with normal acuity orthoptic exercises are indicated, and this type of training is not advisable in children under age five.

#### Objectives Substantiated

It is not surprising to find that the majority of refractive errors were hyperopia and hyperopic astigmatism in this age group. One can expect that a certain per cent of these children will not require corrective lenses when they reach their early teens. The important fact is that they need corrective lenses during the preschool age in order that they may obtain

TABLE 3

| REFRACTIVE ERRORS: 70 CASES         |    |
|-------------------------------------|----|
| Hyperopia and Astigmatism . . . .   | 45 |
| Myopia . . . . .                    | 20 |
| Mixed Astigmatism . . . . .         | 5  |
| MOTOR ANOMALIES: 27 CASES           |    |
| Esotropia . . . . .                 | 20 |
| Exotropia . . . . .                 | 4  |
| Convergence Insufficiency . . . . . | 3  |
| AMBLYOPIA: 8 = 5.7%                 |    |

clear and distinct macular images. This is especially true in those who have large astigmatic errors.

Amblyopia of varying degrees was found in eight cases or 5.7 per cent. The amblyopia varied from 20/100 to 20/50 corrected. Two were in cases of anisometropia (unequal refractive errors), one in exotropia and the remainder in cases of esotropia.

I feel that the results of this study substantiate the two objectives of the preschool vision screening project.

#### Observations and Recommendations

I have the impression that some ophthalmologists have little confidence in a program in which the vision screening is performed by lay personnel. This is probably the result of the poor vision testing done in many schools. My experience with the children and my observation of the screening in our project convince me that properly trained lay personnel can perform these tests adequately. However, it is evident that some additional plan must be devised if we are to reach the major preschool group in our area. For example, in Louisville and Jefferson County we have approximately 16,000 children in the

preschool age group. Among these, 700 to 800 will have major eye defects. Since we previously could screen only 2,379 in 18 months we must step up the program in order to find these children and get them under care.

Recently I met with the local pediatric society and suggested that we start to train one or two of their office assistants to perform the tests, making it a part of the regular physical examination, especially of four and five year olds. I should also like to include the general practitioner in this plan since he perhaps sees as many children at this age as does the pediatrician. If this proposal can be put into effect we can then confine the screening done by our volunteer group to the children of low-income families.

#### POSTGRADUATE COURSES

The Institute of Ophthalmology of the Americas of the New York Eye and Ear Infirmary announces a series of Postgraduate Courses for Specialists to be given from November 3, 1958 to January 9, 1959.

Courses will be given in some 29 subjects, including the following: Cataracts, glaucoma, gonioscopy and tonography, keratotomy and keratoplasty, perimetry, refraction and retinal detachment.

Further information regarding the courses may be obtained by writing to Mrs. Tamar Weber, Registrar, Institute of Ophthalmology of the Americas of the New York Eye and Ear Infirmary, New York 3, N. Y.

#### CINCINNATI EYE BANK

The Eye Bank of the Cincinnati General Hospital has finished its first year of service with a record of about 30 corneal graft operations and the donation of 50 eyes. The bank is closely associated with the University of Cincinnati Medical School.

# SNELLEN AND THE E CHART

GABRIEL FARRELL

Cambridge, Massachusetts

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Most people are familiar with the device in universal use for testing visual acuity, but few know the story of the man whose scientific genius made it available.\*

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OF ALL tests given in these modern days to determine physical condition, personality traits, vocational aptitudes and intelligence quotients, the one probably taken most frequently centers around the letter E. Fully one-half of the people in this country have at some time worn glasses or been tested for them, and they are familiar with the chart used by ophthalmologists and optometrists to prescribe them. Few, however, know the origin of the E chart, the scientific basis on which it was created or the man whose genius made it available for universal use. That is the story of a Dutch professor of ophthalmology, Hermann Snellen. Born in Zeist, Holland, in 1834, the son of a physician, Snellen received his medical degree in 1857 at the University of Utrecht and remained in that community until his death in 1908. In 1858 he joined the staff of the Netherlands Hospital for Eye Patients in Utrecht, and in 1884 he became its director, succeeding the famous Dr. Frans Cornelis Donders (1818-1889). Until

his retirement in 1903 Dr. Snellen devoted himself to the field of ophthalmology, attaining great distinction especially for operations on the eye.

Snellen's name does not appear frequently in encyclopedias or biographical dictionaries, but in the few references to him in professional literature he is described as a profound scholar and a gentleman of great charm. He had a delightful and reassuring manner with his patients and is reported to have been able to speak to them in Dutch, German, French or English.

## Early Inventions

Snellen was seriously interested in the technical aspects of his profession, and invented the celebrated test for one-sided blindness in which red and green letters are viewed through red and green glasses; a new type of artificial eye; the aluminum shield as a substitute for bandages in the after-treatment of cataract; and the Snellen suture still used by ophthalmologists. He also gave a great deal of thought to the types of desks and seats used in schools, and suggested various improvements.

It was through his invention in 1862 of Optotypes, the formal name of his test chart, that Snellen made his great contribution to the science of physio-

\* Some of the material in this article is from the chapter, "Who are the Blind?" in Dr. Farrell's recent book, *The Story of Blindness*, published by Harvard University Press, copyright 1956, and is used by permission of the President and Fellows of Harvard College.

Dr. Farrell for over 20 years was director of the world-famous Perkins Institution.

logical optics. For with this chart eye doctors are able not only to determine visual acuity but also to check on the amount of improvement obtained through the proper corrective lenses.

Only in relatively modern times have myopia, hyperopia and astigmatism interfered appreciably with man's pursuit of life. The invention of printing and the production of newspapers and books motivated people to seek ways of improving sight so that more of them could read, even as today people are seeking visual aid so that they can see TV more clearly. The early answer to the problem was the use of spectacles whose lenses compensated for the errors of far sight, and in the 16th century concave lenses were used for correction of near sight. Bifocals were invented in 1784 by Benjamin Franklin to enable one to see both at distance and near without removing the glasses. It was not until 1801 that Thomas Young, the great physicist and physician of England, demonstrated that astigmatism could be corrected with glasses, and in 1827 cylindrical lenses for this purpose were devised by Sir George Biddell Airy, an English astronomer. All of these discoveries were based on the much earlier claim of the German astronomer and mathematician, Johannes Kepler (1571-1630), that the crystalline lens refracted rays of light and brought them to a focal point on the retina.

#### Crude Tests

Having learned the mechanics of the human eye and its refractive errors scientists turned to the problem of correcting the sight of individuals showing variations from the norm. The early types of lenses and the first

tests were very crude. In England, and probably in other countries, charlatans conducted what today would be called a racket. Going from town to town with bags full of glasses, they tried them on persons eager to read until the type in the book in hand was clearly focused, probably more by anticipation than by actual correction. In 1843 the first scientific trial case was introduced. It consisted of accurately ground lenses which were tried on the patient until the right combination was found.

Heinrich K  chler developed in 1843 a series of different types for testing near visual acuity. Ten years later Edward Jaeger (1818-1884) in Vienna produced his 20 sizes of reading type that still are used for testing at short distances, although there are modern adaptations whose ratings correlate with those of Snellen for long distances.

In 1851 Hermann L. F. von Helmholtz, a German physician and physicist, invented the ophthalmoscope, an instrument that enables the examiner to view the interior of the eye, especially the retina; and six years later Dr. Albrecht von Graefe (1828-1870) began to put it to practical use in his clinic in Berlin. Wherever these instruments were used different tests were developed. "Just as formerly," wrote Snellen, "every town and province desired a different coinage and standard measurements, so it appears that every school of ophthalmology must boast of its own ophthalmoscope and its own visual tests."

#### Development of Practical Test

To remedy the resulting confusion Snellen, at the request of von Graefe, undertook to put eye testing on a



scientific basis. In doing this he drew heavily on the discoveries of Donders, undoubtedly the greatest authority on geometric optics and the first to separate clearly the errors of refraction from those of accommodation. Donders also proved that the antithesis of myopia was hyperopia and not presbyopia.

Snellen's kindly interest in his patients, his competence in ophthalmology and his sound training in optics made him the ideal person to develop from Donders' complicated scientific formulas (in which it is said every symbol of the Greek alphabet was used) a practical way to determine a patient's visual acuity.

"Visual acuity," wrote Snellen, "is measured in the same way as the tactile sensitivity is determined; that is, by the minimum distance at which two simultaneous impressions give rise to two independent sensations." His immediate task was to determine the minimum distance at which symbols could be seen clearly. To make this measurement Snellen changed from the prevailing charts of readable text to the use of single letters. For the major symbol he selected E because it most closely simulated the three parallel lines used by Donders in his study of optics.

To determine the size of the letter a visual angle of five minutes and a distance of 200 feet were selected. In order to have the normal eye see the E clearly at that distance the letter had to be 3.48 inches square. When its three arms with the two interspaces were divided equally each division subtended an angle of one minute. From that start, and on the same principle, Snellen added 10 rows of the more readily distinguishable letters in

a decreasing size series, with those of the last row (to be read at 10 feet) 0.18 inches square.

### Chart Widely Used

Today the chart devised by Snellen for determining acuteness of vision is to be found in eye hospitals in all parts of the world. For modern testing in the ophthalmologist's or optometrist's office the testing distance is 20 feet. The chart, properly illuminated, is placed with the 20-foot line of letters at eye level, since normal eyes are practically at rest when viewing objects at that distance. A person with normal vision should be able to distinguish clearly the 20-foot line at the distance of 20 feet and, if so, his visual acuity is rated 20/20. A person with vision defective for distance acuity will find that he can read only the letters larger than those in the 20-foot line. If the letters he can see clearly are those of the 70-foot line he is rated 20/70. If he can see only the large letter E his visual acuity is 20/200.

It must be understood that these ratings are not to be interpreted as fractions but as scientific measurements of acuteness of central vision at the distance tested; nor should they be confused with measurements of the efficient use of whole or partial sight. They conform to Snellen's formula:  $V=d/D$ , in which V means visual acuity; d is the distance of the person from the chart; and D is the distance at which the letters should be clearly read by a person with normal vision. For example, 20/200 does not mean, as many think, that a person with that acuity is restricted to 10 per cent of the effective use of normal sight. As a matter of fact, he has a visual efficiency of 20 per cent. It does mean



that he can read at 20 feet only the letter he should be able to read at 200 feet if he had perfect sight.

Since Snellen's time eye doctors have become increasingly concerned with helping people who have impaired vision to use their remaining sight as efficiently as possible. Whereas visual acuity is the exact measurement of the sharpness of sight, visual efficiency is defined as the competence of the eyes to accomplish their physiological functions, including not only acuity at distance and near but also field of vision, ocular motility with absence of diplopia, and binocular vision. That competence for distance acuity, as a percentage, has been related to the Snellen ratings by the Section on Ophthalmology of the American Medical Association and revised in 1955\* as follows:

| Snellen Rating<br>Visual Acuity | Per Cent<br>Central<br>Visual Acuity | Per Cent Loss<br>Visual<br>Efficiency |
|---------------------------------|--------------------------------------|---------------------------------------|
| 20/20                           | 100                                  | 0                                     |
| 20/40                           | 85                                   | 15                                    |
| 20/50                           | 75                                   | 25                                    |
| 20/80                           | 60                                   | 40                                    |
| 20/100                          | 50                                   | 50                                    |
| 20/200                          | 20                                   | 80                                    |

In persons with impaired vision, including those falling within definitions of partial sight and of blindness, the visual acuity or the E rating is "after correction." This stresses the importance of the aids that give effective sight and these are obtainable only through scientific tests. The tremendous visual demands of modern life require constant watch of the efficiency

\* Estimation of Loss of Visual Efficiency. Spaeth, E. B.; Fralick, F. B.; and Hughes, W. F., Jr. *AMA Archives of Industrial Health*, 12:439, October 1955.

of our eyes. Prompt detection of defects at all ages is essential if maximum visual efficiency is to be retained.

## FIREWORKS LAW UPHELD

The law banning the sale of fireworks in Pennsylvania was declared constitutional by the Superior Court in an important decision on January 21, reports February *Fire News*, organ of the National Fire Protection Association. Since the Pennsylvania law is considered a model and many other states have similar ones, apprehension was caused when it was declared unconstitutional by the Franklin County Quarter Sessions Court last August.

This decision was made in the case of a storekeeper who sold a toy cannon in which acetylene is exploded. He claimed the toy was harmless. The county court concurred in his further claim that the law was vague and exceeded the proper exercise of police power, and might even be construed to include such harmless articles as coal, charcoal or even candles.

The Commonwealth appealed against this decision, which the Superior Court reversed in a unanimous opinion. Judge C. H. Rhodes, who wrote the opinion, declared that the toy was not harmless, and "children in particular need protection from such devices. Children are naturally inquisitive about such objects and they would be inclined to look into the barrel of these toys or point them at the faces of other children."

**CONFERENCE PAPERS**—The Fall Issue of the *Review* will feature additional papers presented at the NSPB 50th Anniversary Conference, March 12-14, 1958, in Philadelphia.

# Report of Committee on Alleged Relationship Between Fluorides and Eye Disease

National Society for the Prevention of Blindness

## Background

For several generations more than four million people in the United States have spent all of their lives in areas where the drinking water naturally contains fluorides in a concentration of higher than one part per million, which is the concentration recommended by many authorities as the minimum amount needed to prevent a deficiency which leads to dental caries.<sup>1</sup> In addition, more than twenty-seven million persons in more than 1,100 communities drink artificially fluoridated water. Studies have convinced the American Dental Association,<sup>2</sup> National Research Council,<sup>3</sup> American Academy of Pediatrics,<sup>4</sup> United States Public Health Service,<sup>5</sup> American Public Health Association<sup>6</sup> and the American Medical Association<sup>7</sup> that dental caries, at least in part, is a deficiency condition which can be prevented in sixty per cent or more of children by fluoridation of the drinking water to the extent of one part per million. These organizations claim that fluoride at this level is safe. The economic justification for making up this deficiency in the water supply of New York City has been that the estimated cost would be about \$700,000 a year, and that this sum would save an estimated cost of fillings and of dental extractions of \$85,000,000 in the six-to-fifteen-year age group alone.

In a leaflet distributed in New York City by an unidentified group in March 1957, there appeared the state-

ment that among the body harm produced by fluorides in the amount used in drinking water for the prevention of dental caries is failing eyesight. No evidence was given to document this statement.

On March 5, 1957, during hearings before the Board of Estimate of New York City, the statement was made that fluoridation of drinking water can cause "blindness from cataracts."<sup>8</sup>

## Opinion Poll

Because of these statements, which received much publicity in newspapers, the National Society appointed a committee to investigate the validity of the allegations. The committee carried out an opinion poll among eye physicians in:

- a. cities which have drinking water naturally containing one part of fluoride to one million parts of water;
- b. cities in which fluoride in this proportion has been added to the drinking water for at least the past ten years.

All of the physicians polled were specialists certified by the American Board of Ophthalmology as competent in the diagnosis and treatment of diseases of the eye. Each specialist was asked to state "whether you feel there is a positive or negative relation to fluorides, or none at all" concerning the incidence of cataracts and other blinding eye diseases in the areas of their ophthalmological practice.

Forty-one replies were received from ophthalmologists in ten cities in six states where fluorides are naturally present in the water supply (Jacksonville and Sarasota, Florida; Denver and Colorado Springs, Colorado; Fort Dodge and Sioux City, Iowa; Galesburg, Illinois; Green Bay, Wisconsin; Amarillo, Texas; and Alexandria, Louisiana). None of these ophthalmologists reported having observed any increase in cataracts or other eye conditions due to naturally occurring fluorides in the water. Of this group, thirty-six limited their comments to the statement that there was no observable increase in cataracts due to fluoridation; but two (in Green Bay and Colorado Springs) suggested that there might be a relatively lowered incidence of cataract in their communities as compared with patients coming from other nearby communities where the water did not contain one part or more per million of fluoride. Three respondents offered no comment.

Eighteen replies were received from physicians in five cities (Evanston, Illinois; Grand Rapids and Midland, Michigan; Newburgh, New York; Sheboygan, Wisconsin) where the water supplies have been supplemented by the addition of fluorides in the one part per million ratio since at least 1947. All stated that they had observed no relationship between the incidence of cataract blindness or other eye conditions and the initiation of fluoridation of the drinking water.

#### Reported Studies

Certain persons opposed to fluoridation to compensate for the deficiency of fluoride in the water supply have cited the study, "Medical Aspects of

Excessive Fluoride in a Water Supply," by N. C. Leone, M.D., et al, in *Public Health Reports*, Vol. 69, page 925, October 1954. In this study a group of persons living for fifteen or more years continuously in the towns of Bartlett and Cameron, Texas, were studied by teams of physicians and dentists. The water supply in Bartlett during that period contained seven to eight parts per million of fluoride while the water in Cameron contained less than 0.5 part per million. Opponents of fluoridation have cited the incidence of cataract in the town of Bartlett as an argument that fluoride produces eye disease. Actually, according to this study, only 10.5 per cent of persons examined in Bartlett had cataract or other lens opacity, compared with 14.1 per cent of persons examined in Cameron. Thus the community with the high fluoride content in the water had the lower rate for cataracts and other lens opacities.

In "Newburgh-Kingston, Caries-Fluorine Study—Pediatric Findings After Ten Years," by E. R. Schlesinger, M.D., et al, in the *Journal of the American Dental Association*, Vol. 52, page 296, March 1956, is a report of ophthalmological examinations performed on a group of twenty-five children in Newburgh where the water had been fluoridated for more than ten years. On testing with the Snellen chart, the visual acuity of seventeen of the twenty-five children was found to be 20/20 or better. With refracting lenses, six could read 20/20 or better in at least one eye. In two children with myopia, one child's vision could be corrected to 20/50 in the right eye and 20/25 in the left eye, and the other child's vision could be corrected to 20/25 in the right eye and 20/25 in

the left eye. Visual fields were normal for form in all twenty-five children. In the eighteen children in whom the blind spot could be delineated accurately, all were found to be normal. No abnormalities were found in the fundi of the eyes of any of these children. Further ophthalmological study on other children in Newburgh, where the water had been fluoridated, and on children in Kingston, where the water is deficient, were not done because in the opinion of the examining ophthalmologists the ocular findings in this group of twenty-five were no different from the expected prevalence in a general population.

#### Conclusion

The Committee on the Alleged Relation of Fluorides to Eye Disease, following a search of the literature and a poll of the opinions of ophthalmologists practicing in communities where the water naturally or artificially contains fluorides of one part per million or more, finds no support for the claim that there is any relationship between the incidence of cataract, cataract blindness or other eye diseases and the fluoridation of water supply.

Respectfully submitted,

PETER M. MURRAY, M.D.

BRITTAIN F. PAYNE, M.D.

A. GERARD DeVoe, M.D., *Chairman,*  
*Committee on Alleged Relation*  
*of Fluorides to Eye Disease*

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8. *New York Post*, March 6, 1957.

#### GLAUCOMA TESTS EVERY MONDAY

A program of glaucoma detection started in April in Brookline, Massachusetts, under the sponsorship of the local health department and the Lions Club. All citizens over 40 may have a free test by making an appointment for any Monday between 4:30 and 8:30 P.M. The glaucoma clinic is held at the Stephen G. Train Public Health Center. The response has been enthusiastic.

#### LANGUAGE OF LIGHT

The science of lighting has become so technical that it has developed hundreds of terms of its own. In order to standardize these words the International Commission on Illumination has published a book printed in French, English and German, "International Lighting Vocabulary", with definitions of 530 terms as well as many symbols and formulas. One of its principal sections is on the eye and vision.

# TEACHING ARITHMETIC TO THE PARTIALLY SEEING

HELEN AUERBACH

Teacher of the Partially Seeing  
T. M. Peirce School, Philadelphia

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Relating the subject to actual everyday experiences, plus  
a planned, sequential program produces best results.\*

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**T**ODAY arithmetic is taught with major emphasis on meaning and understanding rather than on drill and memorization. In working with the partially seeing our philosophy and methods are basically the same as those employed with children in general. Certain adaptations are of course necessary.

Not too long ago we sought to place our boys and girls in employment not requiring much eye use. Higher schooling was largely of the vocational type. The trend today is toward training them for positions in the same fields as the normally sighted. For this they must be prepared to meet certain standards.

In Philadelphia our classrooms are specially equipped to make these children visually comfortable. The walls and woodwork are painted a restful pale green and excellent lighting floods the rooms. We have the large print books and much of the other equipment that has been designed to help these children learn.

We have 16 low vision classes and 13 for children with normal vision in our school. Our social activities are completely integrated. Recess, as-

semblies, outdoor play days, dramatics, entertainment involve participation as one group. For other subjects the partially seeing are organized in groups of approximately 12 children, according to age and grade, with a specially trained teacher for each group. These conditions give us an excellent opportunity to compensate for visual handicaps. We are able to work with small groups, within a small group, and with individual children.

Most of the many concrete and semi-concrete materials used today in the teaching of arithmetic can be adapted to the use of our children. When we find that the materials are too small we substitute larger ones. In the early grades, for instance, instead of counting and grouping with toothpicks we use tongue depressors. If discs from the supply list are too small, we make larger ones.

## Basis of Teaching

Educators of today feel very strongly that an understanding of the principles underlying arithmetical processes is the goal for which to strive. Before our children reach the stage of abstract thinking we must have woven in and around our teaching all the concrete and semi-concrete helps pos-

\* Presented at the 50th Anniversary Conference, National Society for the Prevention of Blindness, Philadelphia, March 12, 1958.

sible. The former include such objects as apples, oranges, spheres, cubes, discs, sticks, the abacus, fact finders and dissected discs. Among the semi-concrete are picturizations, representations in the form of charts, dots, strokes, circles, drawings and diagrams.

An experienced teacher in this field comes to know which of these many aids will be helpful to her pupils. All children profit from arithmetical work based on actual everyday experiences—shopping, making change, measuring, keeping accounts for school, collections, banking, scores in games. Not long ago emphasis was placed mainly on teaching through such experiences. But we now feel that meaningful learning through experiences is not in conflict with a planned, sequential arithmetic program. Arithmetic is a sequential subject; each new step depends upon previous steps and leads to new steps. For this reason the teacher must work closely with the children, making sure that each step is learned before the new one is presented.

#### **Drill Follows Understanding**

Many people say: "When we went to school we learned our tables. We knew them inside out and backward and forward, and what's more, we never forgot them!" Today educators agree that there is a definite place for drill in arithmetic. But drill must follow understanding. Drill *will* increase proficiency in operations already understood.

I have had the privilege of listening to a talk on arithmetic by Dr. John Clarke, the retired head of the department of teaching of mathematics, of Teachers College, Columbia University, and the author of many books on

the subject. He was asked during the discussion whether it wasn't better simply to drill slower children mechanically in number combinations, since they couldn't get the meaning anyhow. He told us then of an experiment that had been conducted on these very lines. Result: The children memorized what they were taught, but in practical application did not know where to use the processes. Furthermore, over the summer they forgot what they had learned.

Drill without understanding is valueless. If a child knows that five sixes are 30 and that six fives are 30 how much more intelligent and helpful it is for him to understand that one means five bundles of six and the other means six bundles of five. Two 15's are 30 and 15 two's are 30. Though the answer is 30 in each case, the concept is entirely different.

#### **Encouraging the Child**

It is also important for us to build up in the child an attitude of *liking* arithmetic. This is fostered by giving each his attainable goal. The old saying that nothing succeeds like success is very apt here. Success is especially necessary for our children, who are often sensitive because of their handicaps. The challenge to the teacher is to see that one child doesn't find the goal so difficult that he becomes discouraged, or that another does not find it so easy that he is bored.

Among the aids which we use in teaching are large, colorful charts with bold lettering, illustrating simple exercises in addition, subtraction, multiplication, fractions, etc. These aids have been invaluable in our classes. We keep them on the walls and we may go back to them again



and again. If a child is unsure in a process and we feel that the charts will help him understand, we continue to use them.

Some children need these helps over a longer period of time than others, since all do not develop at the same speed. We know that in arithmetic they do not grow automatically. Growth depends upon the teacher, the instructional materials and the child's understanding. Our pupils need competence in computation; those who think things out achieve the greatest satisfaction and progress.

We try to go along, then, with understanding and patience. Ever and always I remind myself as a teacher—especially as a teacher of the handicapped—of a quaint old saying:

Learning by the yard is hard  
But inch by inch, it's a cinch.

#### GIRL BRIGHTENS UP SCHOOLS

A pretty girl of 17 may resent having to wear glasses, but Karel Engel of Brookings County, South Dakota turned her chagrin into a movement for better lighting in the country schools of the whole state. When she realized that most of her former classmates at Fountain School were wearing glasses like herself she started a 4-H project to improve seeing conditions.

With the help of an engineer, reports *Better Light, Better Sight News*, Karel measured the light reaching the desks from two bare bulbs dangling from the ceiling. It was less than one-tenth the illumination required. The local school board promptly installed five banks of fluorescent lights, turned the desks away from window glare, and while they were about it, installed a new heating system.

The reforms at Fountain School snowballed through the state. A rural electrification specialist, William Peterson, sent a questionnaire to county school superin-

tendents to find out their lighting conditions, including location of windows and the color of ceiling, walls, and furniture. This project has already resulted in several county campaigns for relighting and repainting rural schoolrooms.

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#### PLEA FOR CLEAR PRINT

The following letter which appeared in *Publishers' Weekly* of November 4, 1957, is reprinted with permission of the editor.

Editors, *The Publishers' Weekly*

As a librarian, I am deeply concerned about the size of type used in books. The reading public is becoming more aware of the demands small-size print makes upon their eyes. If a library has two copies of the same title, the one with the larger print circulates while the other stays on the shelf. Too, when we suggest a new book to a library patron, he often opens the book to see the size of the print. If it is small, he may remark that he does not want to take that one because the "small print" hurts his eyes! Both children and adults react in the same way. I hope that publishers will do something about this before long, for their continued good health as well as ours depends upon people finding many books so attractive in the size of print used that they will want to read them.

EDITH M. BRAINARD, Librarian  
McKinley Memorial Library  
Niles, Ohio

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#### WHERE THE MONEY GOES

Americans spend four times as much for liquor and tobacco as for keeping themselves well, according to Department of Commerce figures for the fiscal year 1956-57. Alcoholic beverages are listed as costing \$10.5 billions, tobacco \$5.7 billions, while doctors' bills took \$3.3 billions and medical care and hospitalization cost \$1.2 billions.

## NOTES AND COMMENT

### • Symposium on Uveitis

Nearly 300 ophthalmologists from all sections of the country met in New Orleans late in February for a five-day symposium on uveitis. The conference was sponsored by the New Orleans Academy of Ophthalmology, with the object of sparking a nationwide drive against one of the chief blinding diseases.

Dr. Alan C. Woods warned that the so-called wonder drugs check rather than cure uveitis. He felt that the material being gathered by the Public Health Service would provide common ground for eye specialists in their efforts to understand and cure the disease. Another speaker, Dr. Lorenz E. Zimmerman of Walter Reed Army Hospital, made a plea for bequests of slightly diseased eyes for laboratory study. He said that at the Institute of Pathology, of which he heads the eye section, researchers seldom saw an eye with a minor case of uveitis or a related disease, and donor eyes of this sort would expedite their studies.

### • Drive Against Quackery

An intensive campaign against swindles in the health field has been launched by the Post Office Department and the Food and Drug Administration who for more than fifty years have worked together to protect the public. The division of mail fraud investigations of the Post Office carries through cases against swindlers using the mails, and the FDA supplies the medical and technical advice.

At a recent conference of postal inspectors who specialize in this work, George P. Larrick, commissioner of

food and drugs, delivered a talk on medical quackery as a public health problem. He said that medical swindles using the mails are now at a peak and cost the public at least \$50,000,000 a year in nostrums, some of them extremely dangerous to health.

"Why do we have this problem of medical quackery?" Mr. Larrick asked. "It has been described as the world's second oldest profession. Certainly it is as old as recorded history. . . . There are two sides to this problem. Just as it takes two to make a quarrel it takes two to make a swindle—the swindler and the *victim*. Dishonesty, greed, and sometimes ignorance are characteristic of the criminal in this field. Matching them, we have fear, gullibility, and ignorance on the part of those who are taken in. You will notice that the common denominator is ignorance. . . .

"The number of ancient fakes that still survive, or which are revived from time to time, shows how little of our modern medical knowledge has become diffused generally among the public. Despite all the educational information printed today in our newspapers and magazines there are many people who know little more about the human body than if they had lived a hundred years ago."

The Commissioner discussed two lines of attack against frauds. One was law enforcement; and he commended the Post Office Department for securing convictions on 99 per cent of its fraud complaints. The other was public education. He urged that the schools should supply more information about modern medical care and

how to obtain it. And he urged that all organizations concerned with public health take the quackery problem more seriously than some of them now do, and realize that it is their problem. They should use every means to reach the people with the basic sort of information which is the best weapon against the quack.

### • Denver Eye Bank

The first eye bank between Kansas City and the Pacific was opened early in 1958 by the Colorado Chapter of the National Society for the Prevention of Blindness. The Colorado Ophthalmological Society and the division of ophthalmology of the Medical School are co-sponsors with the National Society. All Denver hospitals are cooperating in the program and surgeons from the Medical School will enucleate donor eyes. At present the eyes will be stored at the Belle Bonfils Blood Bank. Dr. Morris Kaplan of Denver, chairman of the eye bank committee, will coordinate requests for donor eyes by physicians throughout the state.

The work of establishing the eye bank has been sparked by Mrs. Austen Brown and Mrs. Marvis Quam, president and secretary of the Colorado Chapter, who received much help from Drs. J. Leonard Swigert and William H. Drogemueller of the Medical School faculty. They are respectively first and second vice-presidents of the Colorado Chapter.

### • Fuel Burns Eyes

A fantastic accident which may blind three boys occurred recently in a high school laboratory in Center Moriches, Long Island. Six pupils who belonged to a local rocket club

were experimenting with a zinc-copper fuel mixture. It was not intended, according to news reports, "for immediate use in a rocket."

Some of the compound was drawn into a test-tube, and had begun to give off sparks when one of the boys walked past with a large crucible full of the mixture. It was ignited by a spark from the test-tube, and in the explosion which followed three students were severely burned in the face and eyes. After first-aid they were rushed to a hospital. All three had such deep corneal burns that a prognosis was deferred.

The experiment was reported to be one prescribed by the New York State Education Department. The county district attorney's office is investigating the case, which belongs to a long and tragic list of injuries to pupils wearing no protectives goggles who have suffered lost or damaged vision in school laboratories and shops.

### • NSPB California Chapter

A well-rounded program reaching schools, industry, and the general public was carried out during 1957 by the California Chapter of the National Society for the Prevention of Blindness. In her report Mrs. Burnetta Downing, executive secretary of the chapter, showed that a total of more than 11,000 persons had been screened for glaucoma during the year. About 4,000 were examined by ophthalmologists at the San Diego County Fair in a project in which the NSPB chapter acted in a consultative capacity. In eight other cities "G Days" were organized by the chapter, and Mrs. Downing trained 360 volunteers to assist the medical personnel in the screening. About a thousand persons

were examined in Santa Ana, and similar numbers in Stockton, Santa Rosa, Riverside and Whittier. Programs almost as extensive were carried out in West Los Angeles, Fresno and Van Nuys.

Three projects for testing the vision of preschool children were carried out by the chapter. The largest was in the 31st district of Los Angeles, where 1,334 children were tested by 108 volunteers from the Parent Teacher Association who had been trained by Mrs. Downing. In Santa Barbara and Berkeley groups of 375 and 549 children were tested. Mrs. Downing acts as vision consultant for the school health section of the Los Angeles City Social Welfare Planning Council, and appears at P.T.A. meetings of the public and religious sponsored schools of the area to explain the principles of eye health and to teach vision screeners.

Reaching teachers and public health nurses with essential information on eye health is an important part of the California program. During the year Mrs. Downing gave a course to 20 student teachers in Los Angeles State College, and conducted classes for public health and industrial nursing students at U.C.L.A. She also gave one-day training courses to public health nurses working for the city or the county of Los Angeles. In each area where "G Days" were conducted, Mrs. Downing held special glaucoma classes for the local public health nurses.

In the industrial field letters were sent to 300 California firms describing the Society's eye protective program, and assistance was given in the activities of the Wise Owl Club. During the AMA Industrial Health Congress

held in Los Angeles in February 1957 tonometry testing for glaucoma was demonstrated to the delegates.

Through films, radio and television appearances and the distribution of literature the general public was given much information about prevention of blindness and the principles of eye health.

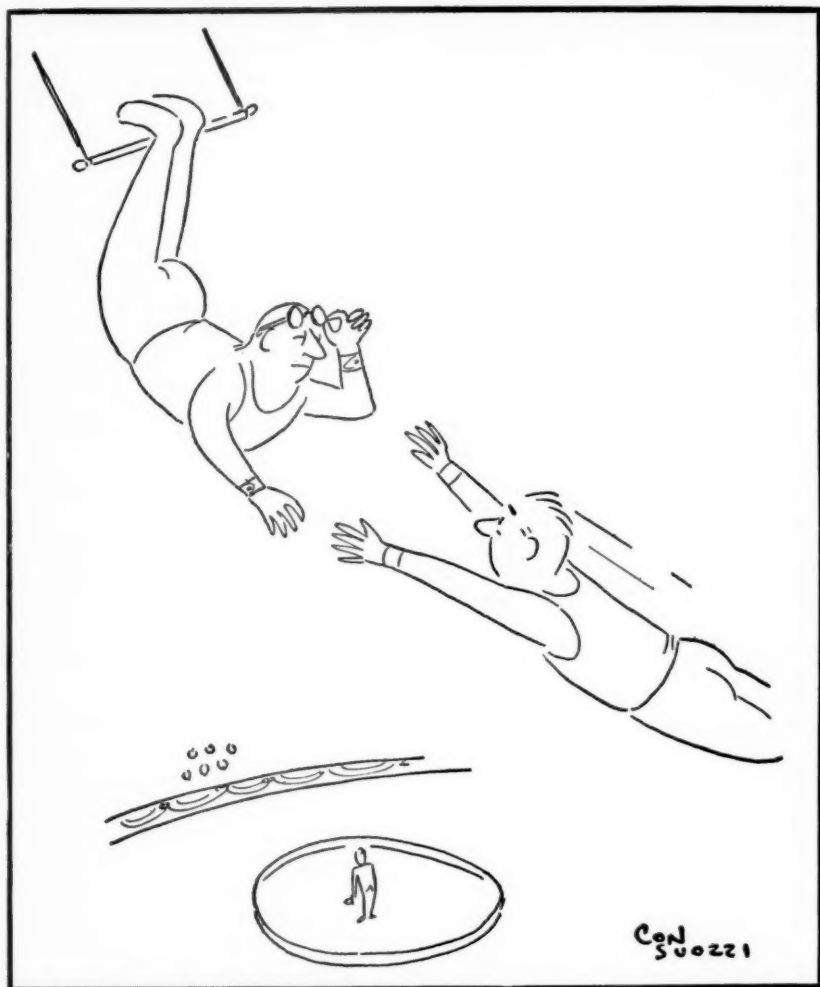
#### • Michigan Tests

Snellen vision tests were given to a million children, and the Massachusetts Vision Test to about 300,000 others in 1957, the Michigan Department of Health reports. The latter test indicated defects in 11.5 per cent of the children, who were referred to doctors.

The state has more than 300 vision technicians certified by the Department of Health, which in 1957 certified 24 new technicians trained during the summer in cooperation with two teacher training schools.

#### • New Laws Might Help

The Federal and State governments might do a great deal to reduce the incidence of blindness, Colonel Austin Lowrey, Jr., said in a lecture to post-graduate students at the Walter Reed Army Medical Center. Since many blinding diseases are hereditary, eugenic advice should be given to all citizens prior to marriage by doctors or nurses well informed on the subject. Consanguineous marriages should be avoided. Premarital physical examinations for the detection of untreated syphilis are essential. All girls should be deliberately exposed to rubella before marriage to avoid the risk of causing severe eye damage to the unborn child if rubella is contracted during the first trimester of pregnancy.



Courtesy of TODAY'S HEALTH and the artist

The country should establish strict safety codes to prevent blindness through injury or disease; pass laws prohibiting the sale of dangerous cosmetics, reducing and depilatory compounds, and insuring the sterility of all ophthalmic solutions and medications; and forbid under severe penalties the sale of a beverage con-

taining methyl alcohol. In World War II, Colonel Lowrey said, 300 men in the armed services were retired for toxic amblyopia from methyl alcohol.

Colonel Lowrey's lecture is one of nine given in February, 1955, and appearing in "Selected Papers from Postgraduate Course in Ophthalmology" published by the Center; 101 pages.

### WILLIAM ZIEGLER, JR.

The Executive Committee of the National Society for the Prevention of Blindness, meeting on April 14, recorded with sorrow the death in New York on March 3rd of William Ziegler, Jr. His age was 66.

A member of the Board since 1945, Mr. Ziegler also served on the Executive Committee and as a vice-president of the Society. Throughout this period he showed a deep feeling for its program and its goal to eradicate preventable blindness. His advice and guidance were consistently beneficial.

Mr. Ziegler's concern with this humanitarian endeavor was reflected in generous personal contributions; and it also led him to arrange for a special grant from the E. Matilda Ziegler Foundation which substantially aided the Society's work on retrolental fibroplasia, the eye disease which formerly took a high toll of vision in premature infants.

Mr. Ziegler's warm sympathies extended over a wide range of philanthropies and civic interests, and he was a distinguished member of the American business community. He was president of both the American Foundation for the Blind and the American Foundation for Overseas Blind; also of the E. Matilda Ziegler Foundation for the Blind, founded by his mother.

For his services to the blind in Italy he was made a Commendatore of the Order al Merito della Repubblica, and received a gold medal from the Italian Red Cross.

He was chairman of the board of directors of the American Maize-Products Company; president and a director of the Great Island Holding

Company; board chairman of the Huttig Manufacturing Company; president and a director of the Park Avenue Operating Company; and board chairman of the Realty Administration Corporation. He had been president of the Royal Baking Powder Company, founded by his father, which was merged in 1929 into Standard Brands, Inc.

Mr. Ziegler was born in Muscatine, Iowa, and attended Columbia and Harvard Universities.

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### KATHERINE A. FISHER

Miss Katherine A. Fisher, retired director of Good Housekeeping Institute and a noted home economist, died at her home in New York on March 17. She had served with distinction as a member of the board of the National Society for six years.

Born in Stratford, Ontario, Miss Fisher was head of the School of Household Science at McGill University in Montreal for seven years. She came to the United States in 1917 and obtained a Master's degree at Teachers College, Columbia University. Before joining the Institute she was a member of the college's household arts faculty.

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### WILLIAM ZENTMAYER, M. D.

Dr. William Zentmayer, professor emeritus of ophthalmology at University of Pennsylvania Graduate School of Medicine, died on March 18 at his home in Merion, Pa. He was 93 years old.

In 1948 Dr. Zentmayer received the Howe Medal of the American Ophthalmological Society for his work in medical education and ophthalmology



and for original investigation. From 1936 to 1950 he was a member of the board of directors of the National Society, and in 1945 he was awarded the Leslie Dana Gold Medal for outstanding public service in prevention of blindness.

Dr. Zentmayer graduated from the Medical School at Pennsylvania in 1886. From 1901 until 1928 he served as attending surgeon at the Wills Eye Hospital in Philadelphia. Since then he had served as consulting surgeon at Wills and St. Mary's Hospitals and at Glen Mills School in that city.

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#### LAWRENCE TYLER POST, M.D.

Dr. Lawrence Tyler Post, former head of the department of ophthalmology of Washington University, died in St. Louis on May 14 at the age of 70.

Dr. Post received his medical degree from Johns Hopkins University in 1913. Throughout his distinguished career he held many important posts in the medical field. From 1931 to 1940 he was editor of the *American Journal of Ophthalmology* and was a consulting editor of that journal at the time of his death. He was elected president of the American Academy of Ophthalmology and Otolaryngology in 1944.

Despite these and other important responsibilities and the demands of medical practice and teaching Dr. Post gave unstintingly of his time to help organize and guide many sound programs for the prevention of blindness. He believed that he had not only an ethical and moral obligation to his community and to the nation, but also that he would better serve his own patients and the residents whose education he guided by making every effort

possible to see that programs for eyesight conservation were soundly conceived and intelligently conducted.

Dr. Post served as a consultant to the National Society for the Prevention of Blindness from 1933 to the time of his death, and was a member of its board of directors from 1952 to 1954. He was a life member of the board of the St. Louis Society for the Blind, and was formerly chairman of the professional advisory committee of the Missouri State Committee of the National Society.

In 1947 he received the Lucien Howe Medal of the American Ophthalmological Society for teaching and leadership in the study of eye diseases. In 1948 he was awarded the Leslie Dana Medal in recognition of his many contributions to prevention of blindness.

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#### FACILITIES FOR THE PARTIALLY SEEING

The National Society's recent tabulation of states, cities and counties which provide special educational facilities for the partially seeing reveals the following:

About 8,000 children are being served in 37 states, the District of Columbia and Hawaii; in 236 cities and 25 counties. The itinerant-teacher plan is used in 27 cities and 20 counties to reach about 1,000 children, and the 7,200 others are taught in 621 special classrooms in 228 cities scattered through 34 states, the District of Columbia and Hawaii.

There are an estimated 78,000 partially seeing children in the country, and 70,000 are still without the needed special teachers and materials.

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**REPRINT**—"Causes of Blindness in Children of School Age" by C. Edith Kerby has been reprinted from the Spring Issue of the *Review*. Pub. 110; 12 pages; price 10 cents.

## ILLINOIS IN BOLD STEP

A new line of strategy in the war against glaucoma is announced by Frank F. Fowle, president of the Illinois Society for the Prevention of Blindness. While continuing its educational program, the Society will now take more direct action, aimed at making the medical profession conscious of the importance of routine tonometry in physical examinations of persons over 40 years of age. The medical examiners for industry and for insurance companies will be urged to adopt routine glaucoma tests. The groundwork for this campaign was laid during the fall of 1957, when the Society helped 473 Lions clubs conduct a vigorous public relations campaign.

The report for the Society's forty-second year of constantly growing service includes many accomplishments, notably passage by the state legislature of a bill banning the sale of sparklers. This involved fighting the lobby of fireworks manufacturers, who are now trying to get the new law repealed. The Society presented evidence to the legislators of countless cases of serious eye injury, blindness, and even death caused by sparklers, and this evidence was widely publicized in the press. Sparklers, along with other fireworks, are now banned in Illinois except when used in supervised public displays.

The Illinois Eye Bank maintained by the Society rounded ten years of service with a 1957 record of 129 donor eyes used for corneal and vitreous surgery and for laboratory research. Continuing its active program in school vision screening, the Society is now doing much work in the southern part of the state, and has added to

its staff a field consultant available to the schools of that area. During 1957 Society workers participated in health education workshops for teachers, in cooperation with Southern Illinois University. The medical social work which the Society has provided for more than five years continues at Cook County Hospital, where over 15,000 patients are treated every year for eye ailments.

The report pays a tribute to Mrs. Ben H. Gray, executive secretary of the Society for the last dozen years, who has resigned in order to devote more time to her family. She is succeeded by Mrs. Alina Drake, who holds a degree in public health from Harvard University, and has had wide experience in medical social work in Chicago and in California.

### GRANDMOTHER MUST PAY

A doting grandmother who encouraged her nine-year-old grandson to shoot off arrows near a small child must pay \$15,240 in damages for an accident causing loss of the girl's left eye. Early in 1957 the New York Appellate Division, upholding a state Supreme Court decision, absolved the boy but held his grandmother negligent in encouraging "foreseeably dangerous" play.

During a visit to his grandparents, the boy was playing with his bow and arrows on a small enclosed porch crowded with his parents, grandparents, and a visiting couple with a 15-month-old daughter. His father finally took away and hid the weapons, and the three men left the porch. Thereupon the indulgent grandmother told the young archer where to find his bow and arrows. Five minutes later an arrow hit the baby's eye.

Her parents sued the boy, his parents, and his grandparents for a total of \$200,000. A jury in the Supreme Court absolved everybody but the grandmother, who appealed, but lost her case.

## AROUND THE WORLD

### CAMBODIA

**French Help Eye Institute.** A description of the Ophthalmologic Institute of Phom-Penh, the only eye-care center in Cambodia, is published in *Archives D'Ophthalmologie* for September 1957. While the Institute and its 60-bed hospital have been under the jurisdiction of the Cambodian Ministry of Health since 1950, there is still a close liaison with French medicine. The Faculty of Medicine of Paris sponsored the organization of a School of Medicine in 1953, and several French professors are in residence in Phom-Penh, the Cambodian capital. As part of this cooperation the French ophthalmologist, Dr. Bernard Lépine, assumed the medical direction of the Institute early in 1956.

Reporting on his first 15 months' work, Dr. Lépine draws a picture of health conditions in Cambodia which might apply to many countries: poverty, malnutrition, lack of hygiene, ignorance and superstition. Most of the 19,000 patients he saw in this period were peasants whose lives are hard and short; in some regions few live more than 65 years. He found that premature aging was common among the Cambodians, and encountered senile cataract in patients as young as 40 years, with the peak of this type of cataract in those between 45 and 55 years. Of the 460 cataract cases he examined only 172 accepted surgery. Actually, the chances of restoring useful vision in this disease and in most eye conditions were seldom bright, since patients were usually brought to the Institute only when they had reached the hopeless stage.

As in other oriental countries, trachoma was the chief scourge, and 60 per cent of Dr. Lépine's patients had various stages of the disease or its complications. An interesting procedure for combatting infection is practised in Cambodia. All children preparing to enter school are screened, and if they have trachoma they are sent to a special school where they receive medical treatment while they are being educated. Only when they are cured may they attend the regular schools.

The seasonal conjunctivitis which often accompanies endemic trachoma occurs during the dry season from January to May. The Koch-Weeks bacillus was frequently implicated, and gonorrheal conjunctivitis was common. Often the cases had arrived at perforation before the patient sought help. Corneal ulcers might result from work injuries, or from a popular eye-wash containing nitric acid. Retinitis pigmentosa, pterygium, optic atrophy and other serious diseases were encountered, but glaucoma, detached retina and strabismus were remarkably low in incidence.

Over a thousand patients were hospitalized during the 15 months following January 1956. Besides the 172 cataract extractions, surgery was given for 344 entropions, 41 pterygia and 32 tumors; and 30 iridectomies and 47 enucleations were found necessary.

Many improvements in the hospital were made during the year. Funds advanced by the United States restored the running water system destroyed during the Japanese occupation and

built kitchen facilities (previously food had been carried a kilometer from another hospital).

## FRANCE

**European Society Founded.** Delegates from 19 European countries met in Paris on May 14, 1957, to found the European Ophthalmological Society. The three members of the directing board elected at the meeting were Dr. Paul Bailliart (Paris), president; Professor Jules François (Ghent), secretary-general; Professor A. Franceschetti (Geneva), treasurer. The membership is limited to ophthalmologists of European nationality who are members of their national society, and each society designates a delegate to the European Society.

The new organization will hold a congress every four years, the first in Athens in April, 1960, with the subject, "Secondary Glaucoma."

## GERMANY

**Retinitis in Young Diabetics.** Of 78 children in a diabetic summer camp, 17 (22 per cent) were found to have retinal changes, according to a report by Dr. E. Heinsius of Hamburg abstracted in the *Survey of Ophthalmology* for February, 1958. The children ranged from 9 to 19 years of age, and retinitis was found at all ages. The children with retinitis had had clinical diabetes for at least four to eight years, whereas the children with normal retinas had diabetes for only one to four years.

The affected group showed the early stages of capillary and venous damage as a rule. In five there were capillary aneurysms or small capillary hemorrhages; five others showed typical white exudates; and eight children

had irregularities of the venules, tortuosities and segmental dilatations. Five of the patients had in addition depigmentation and absent macular reflex, rare in young diabetics.

Boys were more commonly affected than girls. The retinitis children had normal kidneys and capillary resistance. Tests revealed no connection between carbohydrate metabolism and retinitis. Mild myocardial damage was observed in four of those with eye complications.

## GREAT BRITAIN

**Group Ophthalmic Center.** A surgical center serving the eye patients of three London hospitals was opened early in 1958 as the second unit in a regional plan drawn up ten years ago by the Faculty of Ophthalmologists. Their blueprint for an ideal eye service for the entire nation was recommended to the Ministry of Health at that time. It calls for surgical centers with a minimum of 25 beds to give eye patients the specialized care they should have, these centers to replace the pockets of ophthalmic beds in general hospitals.

Sir Stewart Duke-Elder, who formally opened the center, called it a landmark in good planning. He said that the first unit, opened three years ago to serve a hospital group in South Middlesex, was doing magnificent work, and praised the initiative of the Central Middlesex Group in creating the second unit. "I hope that all England will do tomorrow what this regional board has done today," he said.

**Ministry Urges Early Eye Care.** A "Memorandum on the Prevention and Alleviation of Blindness" has been sent by the Ministry of Health to all

family doctors, ophthalmic practitioners and opticians in the National Health Service. Since the number of blind and partially seeing persons is constantly mounting the Ministry urges greater alertness in detecting and treating blinding diseases.

Of the total registered blind in England and Wales at the end of 1956 (96,019) 83 per cent were over 50 years of age. The chief causes were cataract, glaucoma and senile macular degeneration. The memorandum points out that early treatment could have prevented much of this blindness. "It is disquieting to find," it comments, "that some 80 per cent of persons registered as blind from cataract have had no treatment." Of those blinded from glaucoma 40 per cent had failed to take advantage of the free medical care available. Family doctors and all health service personnel who give medical or refractive services should refer for expert ophthalmological opinion any person with even vague symptoms of eye disease, the Ministry advises.

**Essay Contest.** In memory of the great ophthalmologist Treacher Collins the council of the Ophthalmological Society of the United Kingdom has instituted a prize of £ 100 for the best essay on a selected subject. The award is made every three years for work submitted in English by a qualified medical practitioner of any country. The subject for the next award is "The Eye in Relation to Collagen Diseases," and the closing date for sending essays is December 31, 1959. They should be submitted to the Society's secretary at 45 Lincoln's Inn Fields, London, W. C. 2, with the candidate's name in a sealed envelope.

## INDIA

**Seminar in Aligarh.** A national seminar on communicable eye diseases was held at the Institute of Ophthalmology and Gandhi Eye Hospital in Aligarh during November 1957 under the sponsorship of WHO, the Indian Government and the Indian Council of Medical Research. Twenty ophthalmologists from the 14 Indian states and medical officers from Thailand and Burma attended.

For some time the Aligarh Institute has been studying trachoma, and working out effective procedures for a mass control program.

## UNION OF SOUTH AFRICA

**Prevention Services Expand.** The Bureau for the Prevention of Blindness, conducted by the South African National Council for the Blind, now has 45 treatment centers for trachoma patients, the maximum number that can be supervised with the present staff. An eye clinic expected to do much to help the natives of the region is being established at the Klipspruit School for Bantu Blind Children, with a full-time nurse in charge. Funds for the clinic have been contributed by the Women's Federation of South Africa.

The South African public is now becoming interested in corneal grafts as a means of saving vision, and many are now bequeathing their eyes for surgical use after death, or authorizing the use of donor eyes from next-of-kin dying in hospitals.

The government has appointed a commission headed by Dr. Louis van Schalkwijk to develop plans for special educational facilities for partially seeing children.

## CURRENT ARTICLES

***Incidence and Detection of Glaucoma by Routine Tonometry.*** G. L. Porter. *Transactions of the American Academy of Ophthalmology and Otolaryngology*, Vol. 62, p. 54. Jan.-Feb. 1958.

This discussion is limited to the chronic simple type of glaucoma as a diagnostic problem. The author suggests that diagnostic studies be divided into two groups. The primary group, for use on all patients over 40 years of age, would include history, ophthalmoscopy, tonometry and slit lamp microscopy. The secondary group, to be used when the first tests indicate an abnormality, would consist of field studies, provocative tests, gonioscopy and tonography.

Ideally, all 59 million Americans over 40 years of age should be given tonometry by an ophthalmologist. This would mean an impossible 8,000 tests per ophthalmologist. Mass screening and routine tonometry by general practitioners and internists are possible solutions of the problem. In any case the close cooperation of the entire ophthalmologic profession is needed.

Out of the author's series of 2,000 private patients 44 persons (2.2 per cent) were ultimately found to have chronic simple glaucoma. Tonometry detected 35 of these cases (80 per cent) and missed nine cases, because their intraocular pressures were under 25 mm. This would suggest that mass screening surveys using tonometry would be up to 80 per cent accurate.

Of the 44 glaucoma cases, exactly half had optic nerve or glaucomatous field changes or both, and the other

half did not. Of the 22 cases so advanced as to show nerve and field changes 16 had an initial pressure of 25 mm. or higher, while 6 had pressures below 25 mm. In the 22 cases without field changes or disk cupping pressure was elevated in 19 and less than 25 mm. in three individuals. Such patients, with normal pressures and no fundus or field changes, are especially difficult to diagnose, and it is possible that other cases of this kind escaped detection.

Ophthalmoscopy should not be neglected, but it reveals symptoms of glaucoma in an advanced stage, whereas it is desirable to discover the disease earlier. However, 50 per cent of the cases in this study had fundus changes, and 27 per cent of this group had normal pressures.

The secondary group of tests, especially visual field tests, are of the utmost value in diagnosing suspected cases, but Porter feels they are not suitable for routine use in initial screening. A considerable period may be needed to establish a diagnosis in doubtful cases, and these patients should not be told that they have glaucoma. In the author's experience it is virtually impossible to convince a patient who has received an erroneous diagnosis of glaucoma that he is free of the disease.

***Glaucoma Detection in an Outpatient Department.*** M. E. Horsley, P. M. Lewis and H. Packer. *Journal of the American Medical Association*, Vol. 66, p. 1265. March 15, 1958.

This study, made in the outpatient department of the John Gaston Hos-



pital, Memphis, Tennessee, demonstrates the need for routine checking of the eyes in all persons over the age of 40 years for glaucoma symptoms. The authors describe in detail the various tests which the general practitioner, the nurse and the advanced medical student can use after the techniques are mastered. They believe that use of the tonometer requires less time and no greater aptitude than taking the blood pressure, and should be part of every general examination of persons over 40 years of age.

In the six months between September, 1956 and February, 1957 the authors tested 1,210 outpatients not aware of any visual troubles, and found 313 (26 per cent) with intraocular tensions over 25 mm. of mercury. It was possible to make further tests on 259 of these, of whom 49 were found to have glaucoma. This is four per cent of the original 1,210 persons tested, and the percentage would have been higher if all those found with elevated tensions had returned for further examination. In 14 others of the 259 who did return a diagnosis of borderline glaucoma was made.

During the same period all patients over 40 years of age who visited the eye clinic of the hospital were given glaucoma tests, and 46 new cases were discovered.

The test series included tonometer readings, the water provocative and tolazoline tests, optic disk examination, and determination of central and peripheral fields by the tangent-screen and Harrington-Flocks methods. The only significant difference between the first group, most of whom had no subjective visual loss, and the group visiting the eye clinic was in the visual fields tests. The tangent screen showed

a central field loss in 57 per cent of the former group and 87 per cent of the latter. This indicates that loss of central vision had brought these patients to the eye clinic after glaucoma was well advanced.

In mass screening the authors believe that the tangent-screen test has drawbacks. Many of their patients could not understand the purpose and procedure well enough to be cooperative, and thus the results of such testing were not clear-cut. The Harrington-Flocks test for central vision proved simpler and less tiring, and gave more specific results.

This study was supported in part by a grant-in-aid from the National Society for the Prevention of Blindness.

**Evaluation of the "Phosphenator" Device for the Detection of Increased Intraocular Pressure.** L. T. Kurland, D. Sachs, L. C. Kerpelman and F. S. Davis. *American Journal of Ophthalmology*, Vol. 45, p. 272. Feb. 1958.

The Hausted Phosphenator was found unreliable in the diagnosis of glaucoma after a thorough investigation by the authors, of the National Institute of Neurological Diseases and Blindness and the Ophthalmology Research Unit, Walter Reed Army Hospital. They believe that there is a potential danger in using this apparatus as a sole test, since it may give a false sense of security regarding the absence of glaucoma.

The Phosphenator, as developed by C. E. Humphrey, is a device for applying a low-voltage current to the temples just behind the eyes. According to reports by Humphrey and Murgolo, this stimulus "will excite the optic end-organs so that a bluish-

white phosphene (light sensation) is observed by the normal eye, while in the case of increased intraocular pressure the patient reports yellow, orange or red phosphenes."

In this study 195 elderly veterans at the U. S. Soldiers' Home Hospital (group I) and 49 patients and employees at the Walter Reed Hospital (group II) acted as subjects. Eliminated from the statistical evaluation were individuals who did poorly in the Ishihara color test and who failed to give a reliable response to the Phosphenator test by picking from a color chart the tint they reported as a phosphene. Tonometer readings were taken just after the Phosphenator test.

In tabulating the tonometer and Phosphenator results for 93 patients (185 eyes) in group I, it is clear that the Phosphenator could not differentiate low and high intraocular pressures. There were 19 eyes with pressures over 25 mm., and in only one of these was the Phosphenator response abnormal. But it reported abnormal responses for six eyes with pressures under 25 mm. In group II (34 subjects and 67 eyes) there were 14 with tension above 25 mm., and in no case was the Phosphenator color response abnormal. The only patient reported as abnormal by this device did have chronic open-angle glaucoma under surgical and medical control, but his intraocular tension that day was 12 mm. O.S. and 17 mm. O.D. Of the remaining 33 subjects in this group, rated as normal by the Phosphenator, 10 were controls and the other 23 were patients of the glaucoma clinic at Walter Reed. Despite miotics several patients had tensions over 30 mm. But the Phosphenator responses were normal and equal in the

two eyes, even when the tension was elevated in only one eye.

Summarizing the results for both groups: the Phosphenator rated as abnormal four eyes with pressures below 20 mm.; three eyes with pressures from 20 to 25 mm.; one eye with pressure between 25 and 30 mm.; and no eyes of 11 with pressures of 30 mm. and over.

### ***Glaucoma: the Sinister Halo.***

J. R. Miller, *Harper's Magazine*, Dec. 1957, p. 62.

A layman describes his experience with acute congestive glaucoma for the general reading public. Having some knowledge of the disease, he rushed to an ophthalmologist as soon as he saw rainbow haloes around the lights in his office. His tonometer readings were 44 mm. O.S. and 60 O.D., and he was put under pilocarpine control. Several weeks later he was given a peripheral iridectomy in the worse eye, and later a similar operation on the other eye. Vision at the time of writing was excellent, and pressure was controlled with virtually no midriatics.

In his description of glaucoma the author fails to distinguish clearly between the chronic simple and acute forms. He urges tonometry as part of every routine medical examination of persons over 40 years of age, and explains the need of early diagnosis. In his home city, Pasadena, a glaucoma testing center has been established in St. Luke Hospital which is free and operates continuously. In its first seven months of service more than 600 people have been tested, of whom 150 were found in need of attention by an ophthalmologist. The incidence of glaucoma reported for the first three

months was more than four per cent. The center was started by a group of Pasadena ophthalmologists, and is partly supported by the Altadena Lions Club.

**Glaucoma in Medical Practice: Danger of Use of Systemic Antispasmodic Drugs in Patients Predisposed to or Having Glaucoma.** M. Cholst, S. Goodstein, C. Berens and A. Cinotti. *Journal of the American Medical Association*, Vol. 166, p. 1276. March 15, 1958.

Physicians who prescribe atropine or its derivatives, or certain synthetic parasympatholytic agents, for Parkinsonism or gastrointestinal disorders should be sure that their patients do not have glaucoma or a tendency to the disease. These drugs cause relatively little change in the intraocular pressure in the normal eye, but in glaucomatous or potentially glaucomatous eyes may produce an acute attack.

A study made at the New York Eye and Ear Infirmary evaluated dicyclomine hydrochloride for its ocular effects. In 37 patients with normal intraocular tension this antispasmodic caused slight decreases in the accommodation in three. There were insignificant pupil changes in 12 cases, no change in the tension in 20 and a decrease in the remaining 17. Varying doses of dicyclomine were given 17 patients with chronic simple glaucoma. There were no changes in accommodation, no significant changes in pupil size, and in eight subjects the intraocular tension was unaltered. In five it decreased from 3 to 4 mm., and in four it increased one mm. Dicyclomine thus appears to be somewhat safer than other antispasmodics tested

in patients who are predisposed to or have glaucoma.

**The Detection of Glaucoma Before Evidence of Visual Impairment.**

H. Reed and J. E. L. Bendor-Samuel. *Transactions of the Ophthalmological Society of the United Kingdom*, Vol. 77, p. 379, 1957.

When the authors instituted the policy of performing routine tonometry on all patients over the age of 40 they found that half the cases of glaucoma would have escaped notice had tonometry not been part of every ophthalmic examination. In 2,000 consecutive examinations 58 (2.9 per cent) proved to have glaucoma; 28 were diagnosed clinically, and 30, who seemed to be normal, were discovered only after tonometry. Actually, out of 71 patients with elevated intraocular tension only 13 were proved negative by other tests. Seven patients are suspected, and 21 others who failed to attend for investigation doubtless include further cases.

Of the 30 glaucomas which were revealed by tonometry 17 showed no field defects or other visual damage, and miotics may prevent serious deterioration. Repeated tonometry showed pressure over 30 mm. of mercury in 18 patients, and gonioscopy showed 21 to be open angle glaucomas. The water drinking and mydriatic tests were used and tonography proved of great value in establishing diagnosis and is assessing miotic therapy.

**The New York State School Vision Tester.** J. H. Sulzman and C. J. Davis.

*New York State Journal of Medicine*, Vol. 58, p. 833. March 15, 1958.

The authors investigated the New York School Vision Tester, a modifi-

cation of the Bausch and Lomb Ortho-Rater with entirely new slides. This instrument purports to give almost identical failing rates with the Massachusetts Vision Test. Since it is stereoscopic it needs a testing area of only four square feet, while the usual Massachusetts test needs a 20-foot distance. The new slides consist of a symbol E slide for distance acuity and two others for distance and near phorias (a picture of a boy throwing a ball to a dog); and the instrument is simplified.

The new instrument was tested against the Massachusetts test in a public school in Watervliet, New York, where the older test was in current use. A series of 102 children from the first, third, fifth and seventh grades were given the two tests in succession, using separate rooms. The binocular instrument test took two minutes for the first- and third-graders, one minute 30 seconds for the fifth-graders, and one minute 20 seconds for the seventh-grade children. The standard Massachusetts test took almost twice as long.

The Watervliet criterion for failure was a monocular score of 20/40 or less, and half-failure was a monocular score of 20/30 but less than 20/20. All failures were verified by a recheck. Of the 102 children 16 failed the acuity or phoria test or both. There was complete agreement between the two instruments on referral, and virtual agreement on half-failures, except for one borderline case.

The authors conclude that the Bausch and Lomb tester may be substituted for the standard Massachusetts test. The testing personnel found the new instrument easier to use in several respects.

### **Sight Boosters for the Near-Blind.**

H. K. Sargeant. *Today's Health*, Vol. 36, p. 40. January 1958.

Of the three-quarters of a million people in this country with vision of 20/200 or less and thus considered legally blind, a good many can be helped by the new devices which boost residual vision to useful levels. The Massachusetts Eye and Ear Infirmary is one of the institutions which is trying out various magnifying lenses in patients with subnormal vision.

A prize patient of the Infirmary is sixteen-year-old John Fraser, a victim of retrolental fibroplasia. His ophthalmologist and his parents were from the first determined to give him as normal a life as possible, and he was sent to the regular school. He was able to get through the primary grades with strong reading glasses, but at the age of nine he arrived at the smaller-type books. At the Infirmary he obtained his first sight-booster, glasses with a telescopic lens for the better eye, and a frosted lens for the other. He was also given a hand magnifying glass to help with smaller type and a penscope (a pocket telescope much used by bird-watchers) for more distant vision. At fifteen, John had trouble with the tiny coefficients in his algebra book, and was given Sportscoptes, telescopic glasses which can be adjusted like binoculars, and are good for both distant and near viewing. Besides preparing for college, John sings in the church choir, manages a basketball team, is active in Scout work, and reads as a hobby.

Another legally blind boy, Jules Cote, is now a sophomore at Dartmouth College, and with Sportscoptes can read textbooks easily, and also writing on the chalkboard.

Bifocals are now made for low-vision persons in a device which magnifies ten times. The jeweler's loupe with built-in illumination has proved useful for close work, as has a magnifier used in industry for flaw-finding, which has a flashlight in its handle.

Not everyone with subnormal vision can be helped by these aids, either because of the nature of the eye condition, or because of inability to learn to use the device. Young people adapt more easily to special glasses than older ones, since they have not developed reading habits hard to break. But older people who have made the effort to adapt to telescopic lenses are well rewarded.

**Immediate Treatment of Chemical Burns of the Eye.** C. L. Settembrini. *New York State Journal of Medicine*, Vol. 58, p. 742. March 1958.

The importance of immediate and copious flushing of the eye when it is exposed to a foreign chemical substance is shown in the case reported here. A young factory worker whose left eye was splashed by a brass-plating solution at once washed it out with plain water, and saved his vision. However, even a dilute solution of the chemical caused him weeks of pain and low vision, and moderate residual damage.

The brass-plating solution contained these chemicals in ounces to the gallon: copper cyanide (10), zinc cyanide (1), sodium cyanide (6), and potassium hydroxide (12). All are dangerous to the cornea, and potassium hydroxide can damage the epithelium in solutions as dilute as 0.02 per cent. Like silver, copper has a caustic action and can form granular

deposits inside or outside the cells. The cyanides inhibit the healing process.

When seen the day after the accident the patient showed mild lid edema, moderate injection of the conjunctiva, and a corneal abrasion. Visual acuity was right eye 20/20, the injured eye 20/70. Slit-lamp examination revealed heavy exudates on Descemet's membrane. After two days of chemotherapy the symptoms were dramatically worse. Vision was 20/400, the cornea was completely hazy and edematous, and a severe acute descemetitis developed. Six weeks after injury vision in the left eye was 20/30. There were very fine pigment deposits, especially in the lower third of the cornea, and the patient had occasional sharp pains in the eye. He recovered vision simply by following the slogan for industrial chemical injuries: "Never be in doubt, always wash it out with plain water immediately."

**Failure of Silver Nitrate Prophylaxis for Gonococcal Ophthalmia Neonatorum.** H. E. Pearson. *American Journal of Obstetrics and Gynecology*, Vol. 73, p. 805. April 1957.

Of 67,200 babies born in the Los Angeles County Hospital during the period 1946-1956, 40 developed gonococcal ophthalmia. All received silver nitrate one per cent drops before leaving the delivery room. The records were reviewed to discover possible factors in the infections. In 33 per cent of the infected cases the fetal membranes had spontaneously ruptured before labor, which might increase the risk of infection from the cervix. A clearly contributory factor was the prematurity of 42 per cent of the series (about 10 per cent of all births

were premature). The immature fetus has a generally poorer resistance to infection. Two infants, one of them full term, had ophthalmia at birth, and gonococci were found on smears. The mothers were not known to be infected.

Unsuspected low-grade infections in the mother represent a risk of unknown proportions. The danger is clearly greater when there is an active infection with large numbers of organisms in the birth canal. In one case in the series this condition was proved to exist. Another case of infection occurred in the first of premature twins. Presumably most of the organisms in the birth canal were removed during delivery of the first twin; the second was not infected.

#### **The Electroretinogram as a Prognostic Aid in Retinal Detachment.**

J. H. Jacobson, D. Basar, J. Carroll, G. Stephens and A. Safir. *AMA Archives of Ophthalmology*, Vol. 59, p. 515. April 1958.

The results of this study showed a direct and significant correlation between the b-wave amplitude in an electroretinogram (ERG) taken preoperatively and the visual results after surgery. To a less degree the ERG was of prognostic value as regards retinal reattachment. In previous studies the latter has been the criterion for successful treatment. Since the ERG is a measure of retinal viability, the authors feel that restoration of visual function, rather than anatomical integrity, is of prime importance.

A series of 50 patients with retinal detachment were studied at the New York Eye and Ear Infirmary. In this condition the amplitude of the b-wave

is characteristically reduced. In the control series of 500 normal eyes the mean amplitude was 250 microvolts, while in affected eyes it was 52, and in the fellow eye 150. After surgery a statistically significant difference of 34 microvolts was found between successful and unsuccessful anatomical results (72 and 38 respectively). A much higher correlation was found between the postoperative ERG and the visual results. The mean b-wave of those eyes which gained a vision of better than 20/200 was 96 microvolts as against 28 when vision was 20/200 or less.

In no case where the preoperative ERG was "extinguished" (below 15 microvolts) was a visual acuity of better than 20/200 attained. This was also true in four cases of successful reattachment.

This study was supported in part by a grant from the National Society for the Prevention of Blindness.

#### **Association of Factors of Pregnancy with Reading Disorders in Childhood.**

A. A. Kawi and B. Pasamanick. *Journal of the American Medical Association*, Vol. 166, p. 1420. March 22, 1958.

This study tested the authors' hypothesis that reading disorders in children are associated with abnormal maternal and fetal factors causing brain damage. This hypothesis is part of a broader concept of a continuum of reproductive casualty, extending from fetal deaths (abortions, stillbirths and neonatal deaths) through a descending gradient of brain damage manifested in cerebral palsy, epilepsy, mental deficiency, and behavior disorders in childhood. In previous studies they found a positive associa-



tion of these conditions with prenatal and paranatal abnormalities. They also found a predominance of affected males.

The incidence of reading failures is from 72 to 84 per cent higher among males than females (Monroe). The authors took for their experimental group 205 white boys aged between 10 and 14 years registered in school reading clinics in Baltimore. They had an IQ of 85 or more, but were at least two years behind in reading. The controls were an equal number of closely matched boys with no reading disorders. For the mothers of all these children hospital records were available showing complications of pregnancy, delivery and prematurity.

There were 104 pregnancy complications among mothers of boys with reading disorders as against 50 in the control group. Some of these mothers had more than one complication. For the first group the percentage of mothers with one or more complications was 37.6, compared with 21.5 for the controls. If there were two or more complications, the percentages were 16.6 as against 1.5 for the controls.

The types of maternal complications more highly associated with reading disorders were preeclampsia, hypertensive disease and bleeding during pregnancy, all apt to lead to fetal anoxia. The prevalence of prematurity was 11.5 per cent in the group with reading disorders and 4.6 in the controls. No essential differences were noted between the groups in regard to the circumstances of delivery. Neonatal abnormalities (convulsions, cyanosis and asphyxia) had an incidence of 9 per cent in the first group and 4 per cent in the controls.

Summing up these factors, 45 per cent of the reading disorder group were exposed to one or more abnormalities, compared to 28 per cent of the control group.

The authors conclude that a certain proportion of reading disorders might be produced by various complications of pregnancy and birth. These disorders, they feel, should be regarded not as distinct clinical entities but as symptom complexes.

### INFECTION INVADES NURSERY

The scrupulous care needed to protect premature infants from infection was brought out in the correspondence columns of the *Journal of the American Medical Association* of February 15, 1958. A New York City doctor reported the case of a twin boy, kept strictly isolated in an incubator, who developed a serious infection in the right eye. *Pseudomonas aeruginosa* was found to be the agent. About two months after onset the infection had caused paraorbital swelling and a large central corneal necrotic area with yellowish purulent discharge. The left eye was not affected. The second twin had no eye infection.

Answering the question as to the possible source of this infection, the *Journal* editors emphasized the delicacy of the skin and mucous membranes of the premature infant, which make them susceptible to invasion by infectious agents. They said that infection with *Pseudomonas aeruginosa*, "a common contaminant of man's environment," had been reported from the nurseries of several excellently-run hospitals. Sources and reservoirs of infection include the attendant staff, and equipment such as formulas, aspirators and containers.

## BOOKS AND PAMPHLETS

**OPTICAL AIDS FOR LOW ACUITY.** Russell L. Stimson. Braille Institute of America, Los Angeles, California, 1957. 44 p. \$10.00.

This small book has in addition to 20 pages of text a list of reading aids with information as to where each may be procured, and special acuity charts for measuring the degree of subnormal vision.

The first section contains a great deal of practical information. It describes, for example, the specific needs and possibilities for correction of five groups of patients graded according to the dioptric powers of the aids they require. For prescriptions of 6.50 diopters and greater, correction of the better eye only is advised. Reading stands are recommended for use with corrections of 10 to 25 diopters as an aid in holding the book in the proper plane. For corrections higher than 25 diopters stand-type magnifiers are preferable to spectacles. If the latter are prescribed, the bifocal type is best because it permits distance vision for orientation. Several non-optical accessory aids are described including special writing equipment, a needle threader and a reading slit.

The acuity tests for use at 35 cm. include (1) a conventional chart composed of capital letters and numerals; (2) a chart containing isolated lower case words similar to those on the Lebensohn chart; and (3) a new test composed of concentric ring targets and confusion gray discs similar, in principle, to the checkerboard test of the Ortho-Rater. Stimson justifies the need for the concentric ring test on the basis that printed matter "gives

information on only a narrow horizontal field." In contradiction to this view, however, several pages later he says "since the primary purpose of most visual aids for impaired vision is to improve the wearer's ability to read, the effectiveness of the lens should be evaluated by the ability to see printed words."

Perhaps the most valuable feature of this manual is the list of more than 200 optical reading aids and their 34 different sources of supply. These include magnifiers worn as spectacles, those held in the hand, and those supported in a mount which rests on the reading page. Although, at first sight, this list appeared to contain almost entirely different items from those used in our own optical aids department, many proved to be the same or similar devices under different trade names. There is obviously need for a comprehensive set of magnifiers available from a single source and specified in the same units.

Stimson believes that reading aids should be specified in terms of their front vertex powers. This reviewer believes that while front vertex power is of interest because of its relation to the working distance, the equivalent power is the more important specification because it determines the size of the retinal image.

LOUISE L. SLOAN, PH.D.

### **I H B Optical Aids Service Survey: First 500**

**CASES.** The Industrial Home for the Blind, Brooklyn, N.Y., 1957. 47 p.

Early in 1953 the Industrial Home for the Blind started a service for legally blind persons whose residual

vision might be helped by special lenses. The encouraging results of this enterprise are described in a report of the first 500 clients. Leo Esbin, M.D., the staff ophthalmologist, contributed an article to the *Sight-Saving Review* (Summer, 1957) which covered much of the material in this text.

Of the 500 clients, 340 were fitted with optical aids which gave them useful improvement of vision, and 70 others could have been helped by special glasses, but for psychological reasons were unable to adapt to them. Only 90 persons (18 per cent) could not be helped because their eye conditions were too serious.

It is noteworthy that the "miracle" lenses about which there has been recent publicity were found necessary in only 31 per cent of the persons fitted. The other 69 per cent received prescriptions for such lenses as the regular practitioner has in his trial case.

**THE YEAR BOOK OF OPHTHALMOLOGY, 1957-1958 SERIES.** Derrick Vail, M.D., Editor. The Year Book Publishers, Chicago, 1958. 423 p. \$7.50.

After more than 50 years of publication the *Year Book of Eye, Ear, Nose & Throat* has been separated into two independent volumes. The debut of an annual review of ophthalmology in its own boards reflects the tremendous development of the specialty. Dr. Vail, who continues as editor, presents more than twice as many abstracts as in the past, all of high clinical value. The increased scope available has made it possible to include studies from every quarter of the globe.

The editor's plan is to lead off with a long special article. This year Irving H. Leopold presents a critical discus-

sion of ocular pharmacology and therapeutics.

As always, Dr. Vail's occasional notes serve to keep contributions in focus. A series which he calls "terrific" are abstracts of six articles which appeared last year in the *AMA Archives of Ophthalmology*, in which Goodwin M. Breinin of New York University describes the use of electromyography in ocular and neurologic diagnosis. The editor comments, "Breinin opens an entire new field of investigation of ocular motility, its physiology and pathology."

Other investigations given high praise are the use of light coagulation in prophylaxis of retinal detachments, by Gerd Meyer-Schwickerath of Bonn; articles by Edmund B. Spaeth and Harvey E. Thorpe on extraction of foreign bodies; and on chloroform anesthesia for the examination of children's eyes. On this last subject Algernon B. Reese and Herman Schwartz wrote separate articles with identical import: chloroform has proved safe and rapid for anesthetizing babies and young children.

**MANAGEMENT OF THE HANDICAPPED CHILD: DIAGNOSIS, TREATMENT AND REHABILITATION.** H. Michal-Smith, Ph.D., Editor. Grune & Stratton, New York, 1957. 276 p. \$6.50.

A panel of specialists discuss the exceptional child, with emphasis on methods of bringing him to his fullest possible potential. The physicians and educators who contribute chapters on the various handicaps look at the exceptional child not as a clinical case but as a part of society. A final chapter by Dr. Helen M. Wallace deals with the community aspects and care of the estimated six million chil-

dren in this country with a physical, mental or emotional handicap.

Visual handicaps are discussed by Dr. Franklin M. Foote and Miss Helen Gibbons of the National Society for the Prevention of Blindness. The common eye defects are explained, and the rest of the chapter is devoted to methods of educating the partially seeing child so that he may be prepared to work, play and live among the normally seeing.

**THE INFLUENCE OF INTERPERSONAL CONFLICT UPON VISUAL PERCEPTION: A DISSERTATION.**

Clement J. Gresock, M.A. The Catholic University of America Press, Washington, D.C., 1957. 31 p.

The author studied the effect of neutral and threatening stimuli in the form of silhouettes projected on a screen and identified by the subject. Geometrical figures, outlines of airplanes and boats and pleasant social situations were interspersed with hostile scenes such as a threatened lynching or a woman with a switch chasing a small boy.

The 45 subjects included equal numbers of normal, schizophrenic and neurotic males between the ages of 18 and 44. Their recognition thresholds were measured by the amount of background illumination needed to identify the picture. The results showed that this threshold was higher for the threatening stimuli for all three groups, and the neuropsychiatric patients did not respond differentially to the normal subjects. But their perception of all the stimuli was slower than that of the normal group. Other investigators have found that neuropsychiatrics have more difficulty in visual perception which requires active organization than do normal subjects.

**TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY 1957, VOL. 55.** Columbia University Press, New York City, 1958. 805 p. \$18.00.

The papers presented at the 93rd annual meeting of the Society reflect recent advances along a broad front of ophthalmology, with a growing emphasis on surgical procedures. The collection is a valuable one as always. Interest and fluidity are given by the discussions which follow each paper. The dozen theses submitted by candidates for membership in the Society are of special interest to the student, since each one includes an evaluation of the literature along with the author's original work on the problem. Several of these papers have been abstracted for the *Review*.

**TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM, VOL. 77, SESSION 1957.** J. & A. Churchill, London, 1957. 706 p.

Among the distinguished ophthalmologists contributing papers to this volume is Sir Stewart Duke-Elder, who delivered the Bowman Lecture on "The Etiology of Simple Glaucoma." Convinced that of late years too much attention has been "myopically focussed" on the angle of the anterior chamber, Sir Stewart presented a broad view of the disease in his usual masterly fashion. Several other papers on glaucoma, four on ocular aspects of diabetes, and two on uveitis, reflect the British interest in disease entities. This contrasts with the emphasis on surgical aspects of ophthalmology in the United States today.

Papers presented at the Oxford Ophthalmological Congress of 1957 are included as usual. The Doyné

Memorial Lecture was presented by Derrick Vail on "The Zonule of Zinn and Ligament of Wieger." Another American, Edmund B. Spaeth, discussed the treatment of monocular aphakia.

The recently established Treacher Collins Prize was awarded in 1957 to W. H. Summerskill of Southsea for an essay on lacrimal disorders, a précis of which appears in the *Transactions*.

**HOSPITALS AND PUBLIC HEALTH NURSING SERVICES PLAN BETTER PATIENT CARE.** National League for Nursing, Inc., New York City. 1957. 39 p. \$1.00.

The need for closer coordination of hospital and public health forces in order to give patients more complete care led to a 1956 conference in Chicago of groups and individuals interested in this problem. This report covers the two main aspects developed during the conference: planning between hospital and public health agency for care to be given patients, and the broader subject of community planning to assure such care for all patients.

**THE OPEN DOOR.** Helen Keller. Doubleday & Company, New York, 1957. 140 p. \$2.75.

Here are short passages chosen from the writings of Helen Keller which are an open door to her rich inner life. Despite what she calls "the bitter denials of limitation" her philosophy is positive and radiant.

"The seeing are apt to conclude," she writes, "that the world of the blind—and especially the deaf-blind person—is quite unlike the sunlit, blooming world they know, that his feelings and sensations are essentially different from their own . . . that he

is shut out from all beauty of color, music, and shape. They need to be told over and over innumerable times that the elements of beauty, order, form, and proportion are tangible for the blind, and that beauty and rhythm are the result of a spiritual law deeper than sense."

Miss Keller's perceptions are of the spirit, so she can say, "For me there is never a dull day" and "Defeat is a gateway to mental adventure" and "The keenness of our vision depends not on how much we can see, but on how much we feel." In one passage in which she explains her religious credo she declares: "I believe that life is given us so we may grow in love."

Science itself is "faith staking everything on imaginative hypotheses so that it may retrieve larger hopes for the race from the unknown." But then she goes on, in a rare mood of dismay, to chide the modern world for its failure to use the powers of all-round faith: "I did not think I would live to see such nervous collapse of a people—such utter breakdown of fundamentals. Spiritual helplessness is unworthy of us who feel ourselves men and companions equally with the stars and the atoms."

#### WHY TOMES ARE HARD TO READ

As everybody knows, large heavy books like dictionaries and bound journals are uncomfortable to read. One reason is that the inner side of the page is curved in toward the binding, according to Dr. Miles A. Tinker of the University of Minnesota. In a recent article in the *Journal of Applied Psychology* he describes a test made with 104 college students in reading curved and flat texts. Laid flat on a table the curved texts took 36 per cent longer to read than flat ones. Dr. Tinker urges that wider inside margins be used in bulky volumes.

# OPHTHALMOLOGY

## SECTION XII

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☐ Please send full information on the new AO Projection Magnifier.

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## *Introducing* THE NEW ALLIED MUSCLE BALANCE SURVEY TESTER

FOR QUICKER—MORE POSITIVE GROUP TESTING

- Simplicity—permits effective testing on pre-kindergarten children.
- Readily portable—weighs only 6 lbs.
- Permits testing of more children in less time than other instruments!

The Allied Muscle Balance Survey Tester eliminates the necessity of a child having to describe to the examiner what he or she sees. This test has been used effectively with pre-kindergarten children.

The simplified interpretation of a passing or failing response enables school health authorities to enlist the aid of P.T.A. groups in survey testing procedures.

Instrument with projector clamp & screen . . . . . \$78.00  
Projector stand (optional) . . . . . \$11.50



*This is the only instrument where the examiner actually sees how the child's eye deviates from the normal position.*

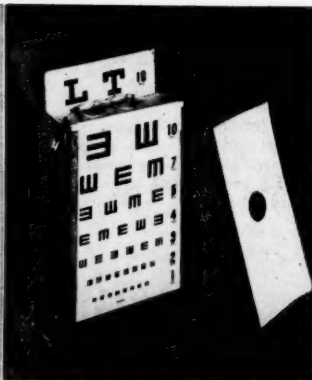
## *Introducing* THE NEW GOOD-LITE TRANSLUCENT MODEL M

A high quality leatherette covered wood cabinet with protective cover and storage space for extra cards, glasses and cord. A translucent chart ruggedly constructed to withstand frequent moving from school to school.

### SPECIFICATIONS

Size 9 3/4" x 16 1/2" x 5 1/4". Current—110-120 volts A.C. only. Standard 8 watt white fluorescent bulb. Weight—6 lbs. Cards of hard plastic with non-glossy surface may be washed repeatedly. A sturdy wooden case that closes completely to protect cards.

\$50.00 complete with 2 cards (your choice).



**SCHOOL HEALTH SUPPLY CO.**

7638 W. MADISON ST. • FOREST PARK, ILLINOIS